INSECTS OF MICRONESIA

Coleoptera: Chrysomelidae

By J. LINSLEY GRESSITT

ENTOMOLOGIST, BISHOP MUSEUM

INTRODUCTION

This report covers material from the Bonin Islands, the Mariana Islands, the principal high islands and several of the atolls of the Caroline Islands, and a few of the atolls of the Marshall Islands. No material is at hand from the Gilbert Islands, Ocean, Nauru, Marcus, or Wake. The specimens were primarily collected by H. S. Dybas, H. K. Townes, R. G. Oakley, P. A. Adams, R. J. Goss, K. L. Maehler, N. L. H. Krauss, J. W. Beardsley, and me. Smaller numbers were taken by R. W. L. Potts, Ellsworth Hagen, D. Langford, R. P. Owen, Y. Kondo, G. E. Bohart, R. M. Bohart, G. D. Peterson, Jr., A. R. Mead, M. M. Ross, S. F. Glassman, and W. H. Hatheway. I have also seen specimens collected by T. Esaki, S. Issiki, and others, which were reported upon by M. Chujo (1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 281-334). About 2,500 specimens of this family from Micronesia were studied.

I wish to express my appreciation to the United States Office of Naval Research, which through the Pacific Science Board (National Research Council), supported much of the field work which resulted in these collections, and to the National Science Foundation, for grants aiding this research. I am also grateful to E. A. Chapin and others of the United States National Museum for making available the collection made by H. K. Townes and R. G. Oakley under the auspices of the U. S. Commercial Company in 1946. Other material was collected under the auspices of United States Naval Medical Research Unit No. 2 (NAMRU-2). I am indebted to R. P. Owen and J. W. Beardsley for specimens belonging to the Trust Territory of the Pacific Islands; to R. L. Wenzel and H. S. Dybas for material from Chicago Natural History Museum; to K. L. Maehler for material belonging to the United States Plant Quarantine collection at Pearl Harbor; to Nodoka Hayashi for the D. Matusita col-

lection; to G. D. Peterson, Jr. for material belonging to the Government of Guam; and to Teiso Esaki for some specimens studied by Michio Chujo. The collections are principally in the United States National Museum and the Bishop Museum, and also in the above-mentioned institutions and the California Academy of Sciences and the Museum of Comparative Zoölogy. J. Bechyné, G. E. Bryant, W. D. Hincks, P. Jolivet, and G. B. Vogt have kindly given help also. And I am much indebted to Dorothy Rainwater for preparing most of the drawings, for which she contributed much of her own time, and to Setsuko Nakata for her assistance.

ZOOGEOGRAPHY

The Chrysomelidae is a family of beetles which is poorly represented on oceanic islands. This is borne out in Micronesia as a whole, but not so conspicuously as in some groups of Pacific oceanic islands where the family is completely absent, such as the Hawaiian, Marquesas, and Society Islands. In Micronesia the family is best represented in Palau, but I do not consider the family well enough represented there to justify calling the group continental.

Of the 18 Palau species, eight are considered to be endemic to Palau. Of these eight, four belong to the subfamily Hispinae, which is a representation out of proportion to the size of the subfamily, compared with the other subfamilies represented. The Cassidinae and eight other Philippine–Papuan subfamilies are entirely absent from the Palaus as well as from the rest of Micronesia, except for two recently introduced species of Cassidinae on Guam (one of which has been introduced to Palau and Truk). The Cryptocephalinae has two, and the Eumolpinae three, species in Palau—all endemic to the Carolines. The Galerucinae has four species in Palau, and most of these are considered to have been brought by commerce or in early human migrations from the west. The Alticinae has four species in Palau, three of them endemic to Micronesia. Of the four Palau hispines, three are endemic species of *Oxycephala,* a genus otherwise known only from areas to the south, and primarily Papuan. No trace of this genus was found on other islands of the Carolines. The fourth Palauan hispine is an endemic species of *Brontispa* (coconut hispine). There are two other known hispines in Micronesia, both also *Brontispa*: one (*chalybeipennis*) in the easternmost Carolines and the Marshalls, the other (*mariana*) in the Truk area, Ulithi, Yap, Saipan, Tinian, and Rota.

Yap has seven species of chrysomelids, of which one is eumolpine, two are galerucine, three are alticine, and one is hispine. All but two are endemic to Micronesia, but none is endemic to Yap.

The majority of species are known to have been introduced on Guam, mostly since 1945. Extensive collecting over most parts of Guam during much of 1945 by G. E. Bohart and me produced only four species, three of which

Distributional List of Micronesian Chrysomelidae*

	Micronesia Island Groups												Other Localities
					Caroline								
	Bonin	Volcano	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	
Cryptocephalinae													
1. Coenobius (s. str.) glochidionis					×		×						
2. C. (Cephalocryptus) macarangae					×		×	×					
3. C. (Cephalocryptus) subaeneus								×					
Eumolpinae													
4. Pagria signata				G*									E. Asia
5. Rhyparida esakii					×								
6. R. wallacei palauana					×	×							
7. R. dybasi					×								
8. R. carolina carolina										×			
9. R. carolina ponapeana									×				
10. R. carolina trukana								×					
11. Phytorus lineolatus				×									Luzon
12. Colasposoma metallica rugiceps				G									Luzon
Galerucinae													
13. Aulacophora marginalis					×		×						Philippines
14. A. flavomarginata					×								W. Indonesia; Philippines
15. A. coralinsula					×								
16. A. mariana				×									
17. A. quadrimaculata				×		×							Samoa; Melanesia ? Queensland
18. A. hayashii				×									
19. A. similis				×	×	×	×						SE. Asia to Samoa
Alticinae													
20. Aphthona bicolorata				×	×			×					New Guinea
21. A. nanyoensis			×	×	×	×	×	×					
22. Altica jussiaeae					×	×							
23. Micrepitrix carolina					×	×							
24. Sphaeroderma wedeliae							×	×	×	×			
25. Schenklingia esakii									×				
26. S. yasumatsui								×					
27. S. yoshimurai								×					
28. Argopistes biplagiatus	×												NE. Asia; Taiwan; Ryukyu
29. Psylliodes cucurbitae	×	×											
30. Nonarthra cyanea	×												Japan; China; Indo-China
Hispinae													
31. Brontispa mariana				×		×	×	×					
32. B. palauensis					×								
33. B. chalybeipennis									×	×	×		
34. Oxycephala esakii					×								
35. O. spaethi					×								
36. O. pandani					×								
Cassidinae													
37. Cassida (Taiwania) circumdata				×	×			×					SE. Asia; Philippines; Ryukyu; Kyushu
38. C. (T.) obtusata				G									S. Asia; Taiwan; Luzon

*The *G* instead of *x* under S. Mariana indicates Guam only.

are assumed to have been introduced by commerce, leaving only one supposedly native species. Another had been taken earlier by Fullaway. Only two were found by Swezey and Usinger. At present there are 10 species on Guam, of which two or three may have been introduced at the end of World War II; three more, around 1950 perhaps.

Truk has 10 chrysomelids, of which two are cryptocephaline, one is eumolpine, five are alticine, one is hispine, and one is cassidine. All but two are endemic to Micronesia and four are endemic to Truk.

Ponape has only four species, one eumolpine, two alticine, and one hispine. Kusaie has only three chrysomelids, an eumolpine, an alticine, and a hispine.

Nine species—two cryptocephaline, two galerucine, three alticine, and two hispine—are found on Caroline Atolls. Seven of these are endemic to Micronesia. Only one species, a hispine, is known from the Marshall Islands; none, from the Gilberts. Of the 10 atoll species, three were taken on no atoll other than Ngaiangl.

Saipan and Tinian have six species: one eumolpine, two galerucine, two alticine, and one hispine. One species is known from the northern Marianas, one from Iwo, and three from the Bonins; and all from these three groups are alticine.

Treated by subfamilies, the Cryptocephalinae is represented by three kinds in Micronesia; the Eumolpinae, by nine; the Galerucinae, by seven; the Alticinae, by 11; and the Hispinae, by six. The Cassidinae is represented by two introduced species. The other 10 subfamilies are absent, though one is found in the New World only and another is primarily temperate.

As mentioned, the family Chrysomelidae is poorly represented on oceanic islands. Quite a number of the species in Micronesia and central Polynesia are introduced. The native species in these areas belong to only a few subfamilies. Chrysomelids apparently have some difficulty either in reaching or establishing themselves on oceanic islands, and it may be assumed that there is particular difficulty in establishment. Since the larvae of many Chrysomelidae have feebly sklerotized exoskeletons and live in somewhat exposed situations on plants or in the ground on the roots of plants, the salt spray in the wind and the high salinity in the soil of the low islands and coastal strips of high islands must be strong limiting factors. The limitations of host-plant specificity must also be a factor for certain groups. Guam has the greatest variety of cultivated crops, to a considerable extent in areas well protected from the effects of salt spray. Guam also has the most extensive commerce, particularly with Asia. Since World War II, at least five species of Chrysomelidae have been introduced to Guam, most of them apparently from Luzon.

Of the 38 kinds of chrysomelids in Micronesia, 31 are believed to have been present for some time and seven are believed to have been introduced

within historic times. Twenty-six are considered to be endemic. Only 10 are known from atolls, and all of these occur also on high islands. Thus there is no clear evidence of atoll speciation; but as pointed out above, atolls are not a favorable environment for members of this family.

The comparison of the Micronesian fauna in this family with that in Samoa is interesting. Though there are twice as many species known from Micronesia as from Samoa, there are no endemic genera in Micronesia, whereas there are two in Samoa. Furthermore, one more subfamily (the Chrysomelinae) is represented in Samoa than in Micronesia. Of several subfamilies, Micronesia and Samoa have roughly equivalent numbers of species, but in the Alticinae and Hispinae, Micronesia has about three times as many as Samoa, even though Samoa possesses an endemic genus in each.

Comparison with the Philippines and New Guinea, indicates the extreme poverty and the oceanic nature of Micronesia, with many subfamilies and tribes and hundreds of genera lacking in Micronesia. Some Melanesian-Philippine genera containing scores of species are absent from Micronesia. Fiji has a much richer fauna, though with a great concentration in the subfamily Eumolpinae.

Aside from the recently introduced species, the Micronesian chrysomelid fauna appears to have strongest affinities with Melanesia, Wallacea, and the southern Philippines. The relationship to Melanesia appears to be strongest. The Bonin representatives are probably of eastern Asian derivation.

Brontispa mariana, a coconut hispine, is one of the two most serious insect pests in Micronesia, the other being the coconut rhinoceros beetle. Serious pests belonging to the Chrysomelidae in areas to the south include several species of the hispine genus *Promecotheca,* which together with other species of *Brontispa,* are among the most serious pests of the coconut palm.

SYSTEMATICS

The following symbols indicate the museums in which specimens are stored: US (United States National Museum), BISHOP (Bishop Museum), KU (Kyushu University), BM (British Museum), CAS (California Academy of Sciences), CM (Chicago Natural History Museum), TT (Trust Territory), MCZ (Museum of Comparative Zoölogy), and HSPA (Hawaiian Sugar Planters' Association Experiment Station).

Under each species the distribution records are arranged geographically from north to south, from the Bonins to Guam, and then west to east, from Palau to the Gilberts. Within Palau, records are from north to south, and within Truk, from west to east.

Key to Micronesian Subfamilies of Chrysomelidae

1. Head normal, with vertex not projecting and with mouth directed forward or somewhat downward 2
   Head with vertex projecting strongly forward and mouth directed posteriorly below; mouth sometimes partly hidden by prosternum 5

2(1). Antennae not closely inserted on front of head, separated by frons or vertex; elytra generally somewhat rigid 3
   Antennae closely inserted on front of head; elytra often not very rigid 4

3(2). Middle three abdominal sternites constricted in central portions; form of body subcylindrical .... **Cryptocephalinae**
   Middle three abdominal sternites not constricted; form of body more or less ovate or rounded; often strongly convex with prothorax narrower than elytra .... **Eumolpinae**

4(2). Posterior femur not greatly enlarged; femoral organ lacking; anterior coxa conical apically .... **Galerucinae**
   Posterior femur greatly enlarged for jumping, and having an endoskeletal organ; anterior coxa not conical apically .... **Alticinae**

5(1). Pronotum and elytra without broad expansions, often spined, but Micronesian forms elongate and unspined; head not covered by pronotum .... **Hispinae**
   Pronotum and elytra with broad marginal expansions, the former often covering head .... **Cassidinae**

CAMPTOSOMES

Antennae widely separated basally; mouth at anterior end of head; elytra rigid; third to fifth abdominal sternites constricted in middle; pygidium generally exposed.

Subfamily CRYPTOCEPHALINAE

Body cylindrical; head short and inserted in prothorax; prothorax about as broad as elytra; antennae long and slender, almost never serrate, rarely with terminal segments thickened.

This subfamily is represented by three forms in Palau and Truk.

Genus **Coenobius** Suffrian

Coenobius Suffrian, 1857, Linn. Ent. **11**: 61 (type: *C. triangulum* Suffrian; Africa).—Chapuis, 1874, Gen. Col. **10**: 177.—Jacoby, 1908, Fauna of India, Col. Chrys., 182.

Antennae relatively short, the terminal six segments thickened; eyes more or less touching above; prothorax narrowed anteriorly and with base ridged and with a short median lobe; scutellum lanceolate; elytra with strong epipleural lobes and regularly striate-punctate; prosternum broader than long.

This genus is widespread in the Old World, but is poorly represented on oceanic islands.

Key to Micronesian Species of Coenobius

1. Antennae long and slender; pronotum heavily punctured; elytra deeply grooved (subgenus *Cephalocryptus*) 2
   Antennae short, with last six segments broadened and flattened; pronotum largely impunctate; elytra feebly grooved (*Coenobius s. str.*) .... **glochidionis**
2. Prothorax pitchy bronzy, brownish at sides; elytra each with an oblique discal band, and apex, pale brown; scutellum tapering posteriorly; seventh elytral groove preceded by a double row of two punctures each behind humerus .... **macarangae**
   Prothorax and elytra entirely greenish black, except for anterior collar of former which is paler; scutellum almost parallel-sided; seventh elytral groove preceded by a single row of two punctures behind humerus .... **subaeneus**

Subgenus **Coenobius,** s. str.

1. **Coenobius (Coenobius) glochidionis** Gressitt, n. sp. (fig. 1, *a*).

Male: Pitchy reddish black, slightly darker on pronotum and a little paler on frons and apex of abdomen; labrum, palpi, and legs testaceous; antenna testaceous on slightly more than basal half, blackish on remainder. Body largely glabrous, with some pale hairs on median portions of sternites, and on legs.

Head round in outline when viewed from front; eyes large, feebly swollen, slightly separated above, deeply emarginate; frons slightly raised, flattish, but deeply punctured, slightly broader below than at vertex; interocular areas above vertex finely punctured. *Antenna* reaching somewhat beyond hind angles of prothorax; last six segments somewhat compressed and mostly a little broader than long; pedicel thick, about as long as third segment. *Prothorax* as broad as elytral base, nearly twice as broad as long, narrowed apically, subevenly rounded at lateral margin and briefly collared at apex; disc evenly convex and shiny, indistinctly punctulate except for subbasal row of punctures, which are fine, but distinct, and close to basal margin; a finer row of punctures bordering lateral margin and apical collar. Scutellum narrow, tapering and acute, more than twice as long as broad. *Elytra* slightly broader than prothorax a little behind humeri, rounded-truncate posteriorly; each with 11 distinct and even puncture-rows, the rows slightly grooved and with moderate, narrow punctures; seventh to ninth rows abbreviated anteriorly; interspaces slightly convex, more convex laterally. *Ventral surfaces* in large part distinctly punctured; first abdominal segment as long as remaining combined. *Legs* short; femora shiny and somewhat flattened. Length 1.65 mm., breadth 0.92 mm.

Female: Last sternite with an elongate concavity; hind femur reaching to apex of first abdominal segment. Length 1.9 mm., breadth 1.15 mm.

Paratypes: Ranging from reddish to nearly black. Length 1.4-1.9 mm., breadth 0.85-1.15 mm.

Holotype, male (US 62413), northeast coast, Peleliu I., Palau, Jan. 28, 1948, H. S. Dybas; allotopotype, female (US), same data; 66 paratypes (BISHOP, CM, US, CAS, BM): paratopotypes, Jan. 1948, Dybas, July 1946, on *Glochidion* and "*Acacia,*" Oakley, and Dec. 1952, Gressitt (Mt. Amiangal); Koror, July 1946, on *Glochidion,* Oakley; Nov. 1947, Dybas; Limestone Ridge, Koror, Jan. 1948, Dybas; Koror, Mar. 1949, on rotten banana corm; west Koror, Dec. 1952, Gressitt, Mar. 1954, Beardsley. Wooded peak southwest of Ulimang, northeast Babelthuap, Dec. 1947, Dybas; "NW.

Auluptagel" [Ngarmalk][1] I. and Malakal I., Sept. 1952, Krauss; Auluptagel [Ulebsehel], Feb. 1952, Beardsley; Ngeremediu, northeast Ngurukdabel; Ngaiangl, Ngaiangl Atoll, Dec. 1952, Gressitt.

DISTRIBUTION: Palau (including Ngaiangl Atoll).

HOST: *Glochidion ramiflorum* Forst. Also cacao (*Theobroma*); questionably, *Leucaena glauca*.

Differs from *C. laevicollis* (Jacoby) in having the punctures finer on the base of the pronotum and on the elytra and in having the frons deeply punctured.

Subgenus **Cephalocryptus,** new subgenus

Head nearly round in anterior outline; frons narrowly trapezoidal; eyes angulately emarginate, nearly touching above; antenna three-fourths as long as body in male, more than one-half as long as body in female, slender, with distal segments more than twice as long as broad, and more or less cylindrical; prothorax with a projecting apical collar, strongly swollen above, with basal puncture-row at bottom of a steep basal declivity; elytra rounded-trapeziform, each with nine deep punctured grooves besides a depressed row near scutellum; prosternum and mesosternum broad, margined; first abdominal segment nearly as long as remaining combined; legs short; tarsal claws appendiculate.

Type: *Cephalocryptus macarangae* Gressitt, new species.

Range: Truk and Palau.

Differs from *Coenobius s. str.* in having the antennae longer, with the distal segments much longer than broad and not flattened, the pronotum more convex, more deeply punctured and transversely depressed near base, and the elytra very deeply grooved.

2. **Coenobius (Cephalocryptus) macarangae** Gressitt, n. sp. (fig. 1, *b*).

Female: Oblong-ovate, narrower anteriorly. Testaceous to black: head ochraceous in front; antennae testaceous with last two segments nearly black and preceding four dark distally; pronotum bronzy pitchy black on upper portion of disc and ochraceous at sides; elytra bronzy pitchy black with a broad, oblique, testaceous band on each starting behind humerus, nearly reaching suture at middle, and then continuing posteriorly parallel to suture and expanding on apical margin; ventral surfaces ochraceous on prothorax, pitchy black on remainder; legs testaceous. Body glabrous above, moderately clothed beneath, and on frons and legs, with short suberect pale hairs.

Head ensconced in prothorax, slightly deeper than wide; frons longer than broad, broader beneath, fairly flat but deeply punctured; eyes large, nearly meeting above, subacutely emarginate; last segment of maxillary palpus long, subacute. *Antenna* slender, more than one-half as long as body; scape twice as long as pedicel, which is thicker, but slightly shorter, than third segment; third to last subequal in length, all slender; the last five slightly flattened, each at least three times as long as broad. *Prothorax* less than twice as broad as long, moderately narrowed anteriorly, subtrapeziform, broadly collared anteriorly, depressed along subbasal puncture-row; disc swollen above, deeply but not very closely punctured, the punctures larger and closer at sides, in part longitudinal and in rows, but with a smooth oblique swollen area near base; basal margin feebly obtuse in outline. Scutellum at least twice as long as broad, evenly tapering and acute, depressed at

[1] Brackets, [ ], indicate proper spelling; parentheses, ( ), indicate an alternate or incorrect spelling.

middle of base. *Elytra* as broad as prothorax basally, slightly broader behind humeri, rounded-truncate behind; each with nine deep subobliquely longitudinal grooves, besides a short depressed row of feeble punctures on slightly less than basal half parallel to suture; first deep groove reaching suture behind middle, sixth deep groove preceded by a double row of two large punctures each; the grooves with distinct punctures to apices. *Ventral surfaces* in large part finely punctured; prosternum broader than long, heavily punctured, margined laterally; mesosternum very broad, similar to prosternum, sides of metasternum distinctly punctured; first abdominal sternite sparsely punctured; last sternite with a large median oblong-oval impunctate concave area. *Legs* short, stout; tarsi distinctly shorter than tibiae. Length 1.95 mm., breadth 1.1 mm.

Male: Pronotum less deeply grooved subbasally, more yellowish at sides; elytra less deeply grooved, more extensively pale. Length 2 mm., breadth 1.25 mm.

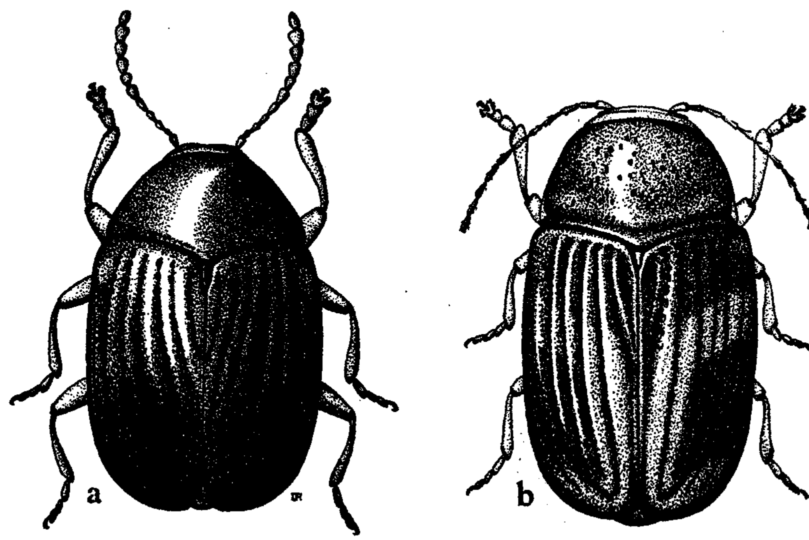


FIGURE 1.—a, *Coenobius* (*s. str.*) *glochidionis*, holotype, male; b, *Coenobius* (*Cephalocryptus*) *macarangae*, holotype, female.

Holotype, female (US 62414), Mt. Iron, north-central Fefan, alt. 250 m., Truk, on *Macaranga carolinensis*, Jan. 31, 1953, Gressitt. Another female specimen (BISHOP), Ngaiangl Islet, Ngaiangl Atoll, Palau Islands, Dec. 16, 1952, Gressitt, differs in only minor details, such as pronotal sculpture, and must provisionally be assigned to this species. A male topotype (BISHOP), same data as type except 180 m., sweeping, is not designated allotype, though it very likely represents the male of this species.

DISTRIBUTION: Truk and Palau (Ngaiangl Atoll).

HOST: *Macaranga carolinensis* Volkens.

Differs from *Coenobius glochidionis* in being more oblong, in having longer, more slender antennae, much more uneven and heavily punctured pronotum and much more deeply grooved elytra, besides differing in color. Differs from *C. binotatus* Lea in having the pronotal disc heavily punctured

and grooved subbasally, the elytra more deeply grooved, and in other characters.

3. **Coenobius (Cephalocryptus) subaeneus** Gressitt, n. sp. (fig. 2).

Male: Shiny greenish black, in part paler; head slightly bronzy reddish brown; antenna testaceous basally, brownish black on last six segments; prothoracic collar slightly pale; ventral surfaces in part tinged with reddish pitchy, particularly on pro- and mesosterna; legs testaceous.

Head deeply and not very closely punctured on frons; eyes nearly touching above. *Antenna* three-fourths as long as body, slender, with last six segments each gradually thickened and slightly flattened distally, but each about three times as long as broad. *Prothorax* similar in structure to that of *C. macarangae,* but with posterior declivity more pronounced, and convex impunctate band behind anterior margin more even and more regularly bordered with punctures. Scutellum narrow, subparallel-sided. *Elytra* broadened

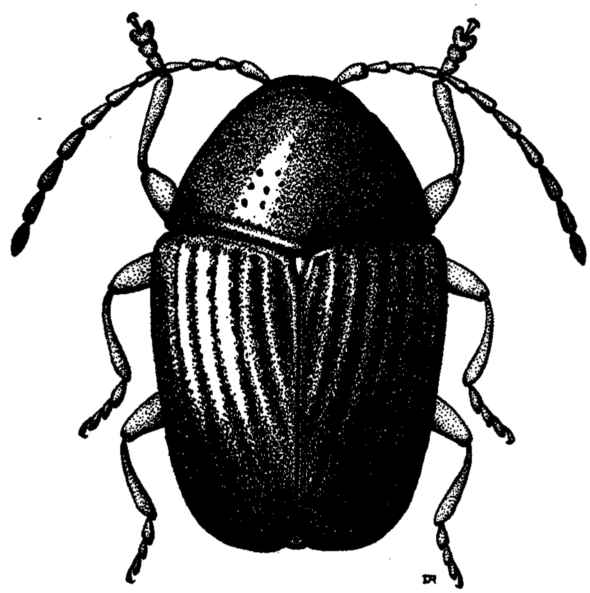


FIGURE 2.—*Coenobius* (*Cephalocryptus*) *subaeneus,* holotype, male.

behind humeri, broadly rounded behind; each deeply grooved, the seventh groove preceded by two separate punctures, arranged longitudinally. *Ventral surfaces* largely punctured, densely so on pro- and mesosterna. Length 1.8 mm., breadth 1.05 mm.

Holotype, male (US 62697), Mt. Unibot, alt. 130 m., Ton (Tol) I., Truk, on *Glochidion puberulum,* Dec. 31, 1952, Gressitt.

DISTRIBUTION: Eastern Caroline Is. (Truk).

HOST: *Glochidion puberulum* Hosokawa.

Very similar in structure to *C. macarangae,* but with dorsum entirely blackish, pronotum with raised band parallel to anterior margin more regularly

bordered, posterior margin more steeply declivitous, scutellum parallel-sided, and elytra with punctures a little more distinct, the seventh groove preceded by a single pair of punctures forming a straight line with groove.

CYCLICA

Antennae widely separated at bases; third to fifth abdominal segments not constricted at middle; pygidium not exposed; head short; eyes not prominent; prothorax with distinct lateral margins; prosternum broad.

Subfamily EUMOLPINAE

Body convex, broad; head inserted in prothorax; prothorax generally narrower than elytra; legs not compressed; abdomen not grooved for reception of legs; third tarsal segment deeply lobed.

This subfamily is represented in Micronesia by nine forms of four genera. The single species each of three genera were introduced, two of them recently. The members of the other genus exhibit some degree of speciation, occurring on the five high island groups of the Caroline Islands.

Key to Micronesian Genera of Eumolpinae

1. Tarsal claws bifid (double)........ 2
   Tarsal claws appendiculate (each with a short, broad basal tooth); anterior margin of proepisternum concave; head grooved above each eye, body small, with pale elytra and dark, heavily punctured prothorax........ **Pagria**

2(1). Mid and hind tibiae emarginate just before apices; elytra with rows of punctures........ 3
   Mid and hind tibiae not emarginate just before apices; anterior margin of proepisternum straight; eyes about one-half as deep as spaces between them; elytra irregularly and heavily punctured; pronotum grossly punctured; body greenish bronzy........ **Colasposoma**

3(2). Each elytron with side more or less vertical, humerus prominent, and disc strongly punctured or deeply grooved........ **Rhyparida**
   Each elytron with side sloping, humerus not prominent, and disc feebly grooved and feebly punctured........ **Phytorus**

Tribe PAGRIINI

Genus **Pagria** Lefevre

Pagria Lefevre, 1884, Soc. Ent. France, Bull. **1884**: lxvii (type: *P. suturalis* Lefevre; Africa); 1885, Cat. Eumolp., 62.

Body small, ovate; prothorax narrower than elytra, slightly angulate behind middle of each side; eye entire; frons broad, a deep groove just above eye; each femur with a ventral postmedian tooth; mid and hind tibiae emarginate preapically.

This genus is distributed from Africa to Japan and Indonesia. It is introduced in Micronesia, which is the easternmost record. Some species are pests of beans.

4. Pagria signata (Motschulsky).

Metachroma signata Motschulsky, 1858, Etud. Ent., 110 [Burma; type in Moscow (?)].

Nodostoma consimile Baly, 1874, Ent. Soc. London, Trans. **1874**: 168.

Pagria signata, Jacoby, 1908, Fauna of India, Col. Chrys., 356, fig. 125.

Head and prothorax pitchy black, reddish on mouthparts, postocciput and anterior margin on pronotum; antennae ochraceous, duller distally; elytra pale ochraceous, slightly darker around mid-basal raised area and along suture; ventral surfaces dull ochraceous; legs paler.

Head deep, smooth in front, with sparse, deep punctures; *antenna* slender, more than one-half as long as body, third and fourth segments more slender than others; *prothorax* broader than long, feebly angular behind middle of each side, grossly punctured, particularly on each side of disc; *elytra* seriate-punctate in 10 or 11 rows, but the rows incomplete, mostly disappearing near middle and also lacking on a round mid-basal raised area on each; *abdominal sternites* finely punctured; femora swollen. Length 1.8 mm., breadth 1.2 mm.

DISTRIBUTION: East Asia, Ryukyu Is., Japan, Guam.

S. MARIANA IS. GUAM: Mt. Lamlam, Oct. 1952, Krauss; Merizo, May 1951, Peterson, on beans. Possibly introduced from Okinawa or Japan after 1945.

HOST: Beans (*Phaseolus* spp.).

TRIBE METACHROMINI

The characters and limits of this tribe are not well understood. Dr. Bechyné writes me that he thinks perhaps the following two genera belong neither to this tribe nor to the Typophorini in which *Phytorus* is placed in the Coleopterorum Catalogus.

Genus **Rhyparida** Baly

Rhyparida Baly, 1861, Jour. Ent. **1**: 286 (type: *R. dimidiata* Baly; Australia).—Jacoby, 1908, Fauna of India, Col. Chrys., 378.

Marsaeus Clark, 1864, Jour. Ent. **2**: 252 (type: *Cryptocephalus didymus* Fabricius; Australia).

Antenna long and slender; clypeus emarginate apically; eyes slightly emarginate, separated by a distance slightly exceeding diameter of one; pronotum transverse, feebly punctured, distinctly margined; each elytron with 13 longitudinal rows of punctures, some of them incomplete; mid and hind tibia emarginate preapically.

This genus is so extensively represented in the New Guinea and Philippine areas, and the species are so poorly known, that it is difficult to say from which area the Micronesian species are principally derived. The distribution of the genus extends to Samoa, New Caledonia, North Australia, Sumatra, Borneo, Bengal, Mauritius, and Madagascar; but there are few species recorded from continental Asia. The Micronesian species possibly arose from three or four ancestral introductions. None have been found on atolls.

Key to Micronesian Species of Rhyparida

1. Elytra distinctly punctured but lacking distinct longitudinal grooves; pronotum deeply, though not very grossly, punctured........ 2
   Elytra with rows of punctures in longitudinal grooves; pronotum finely punctured........ 4

2(1). Body generally 4-5.5 mm. long, testaceous brown to plain reddish, or with a dark area on each side of pronotum........ 3
   Body generally 5.6-6.5 mm. long, dark reddish to pitchy with a slightly metallic tinge, the pronotum often nearly black; second complete puncture-row from suture with about 50 punctures; Ponape........**carolina ponapeana**

3(2). Body generally testaceous brown, with a dark area on each side of pronotum; second complete puncture-row from suture with about 45 punctures; Kusaie........**carolina carolina**
   Body entirely reddish brown, without dark spots on pronotum; second complete puncture-row from suture with about 40 punctures; Truk........**carolina trukana**

4(1). Each elytron without a strong ridge behind humerus; all femora toothed beneath, distal to middle, sometimes feebly so on mid femur........ 5
   Each elytron with a strong ridge behind humerus; humerus projecting and flat above; only fore and hind femora toothed beneath; blackish on humerus, behind humerus and on a small area between humerus and suture; Palau........**esakii**

5(4). Elytra about twice as long as head and prothorax combined, each more or less distinctly marked with black to pitchy on humerus, a median discal stripe from beginning of second third, a spot between humerus and suture, and a less distinct sutural stripe and vague area along central portion of external margin; elytral punctures much narrower than interspaces; aedeagus with three terminal processes, each of about the same length, the middle one narrower; Palau; Yap........**wallacei palauana**
   Elytra more than twice as long as head and prothorax combined, unmarked; elytral punctures apparently nearly as wide as interspaces; aedeagus with a single, broad-based terminal process; Palau........**dybasi**

5. Rhyparida esakii Chujo.

Rhyparida esakii Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. 24 (3) : 284, fig. 2 (Palau: Ngiwal-Ngarard; type in Taiwan Agric. Res. Inst.).

Female: Castaneous brown, in part pitchy: head largely pitchy; antennae ochraceous, darker on scape; prothorax reddish castaneous with sides of disc largely pitchy black; scutellum dark reddish; elytra each reddish with indistinct pitchy marking on humerus and humeral ridge, base of fourth interpunctural strip and central portion of sixth; ventral surfaces and legs reddish brown, in part pitchy.

Head medially grooved on center of occiput, finely and sparsely punctured on frons; *antenna* slender, the segments of similar length except for second. *Prothorax* less than twice as broad as long, moderately convex, smooth; finely, distinctly, and sparsely punctured; sides subevenly rounded; basal margin convex. Scutellum rounded behind. *Elytra* subparallel and moderately long; each with about 11 puncture-rows at middle, the grooves distinct but not deep, the punctures not very large, slightly smaller posteriorly, the interspaces much broader than the punctures, feebly convex; eighth interspace at base forming a strong ridge continuing from humerus. *Ventral surfaces* largely impunctate, partly striate. Fore and hind femora feebly toothed beneath. Length 6.5 mm., breadth 3.6 mm.

DISTRIBUTION: Western Caroline Is.

PALAU. BABELTHUAP: Ngiwal, Dec. 16, 1952, Gressitt, taken in light trap in village, behind beach. This is only the second specimen recorded, and it comes from the type-locality area.

6. Rhyparida wallacei palauana Chujo (fig. 3, *a, c*).

Rhyparida palauana Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. 24 (3): 286, fig. 3 (Koror; type in Taiwan Agric. Res. Inst.).

Male: Pale reddish castaneous, marked with pitchy black: head reddish, darker on vertex and postocciput; antenna ochraceous basally and brownish distally; prothorax reddish with a large indistinctly bordered pitchy area on each side of disc; scutellum translucent, appearing reddish pitchy; elytra reddish, shiny, with sutural, median, and lateral black stripes and humerus and a short mid-basal stripe, also blackish; ventral surfaces reddish, largely pitchy on thorax and epipleura; legs pitchy black with basal halves of femora and tibiae reddish.

Head finely punctured on frons, less distinctly so on occiput; occiput feebly grooved just behind apex. *Antenna* slender except for scape; second segment nearly as long as

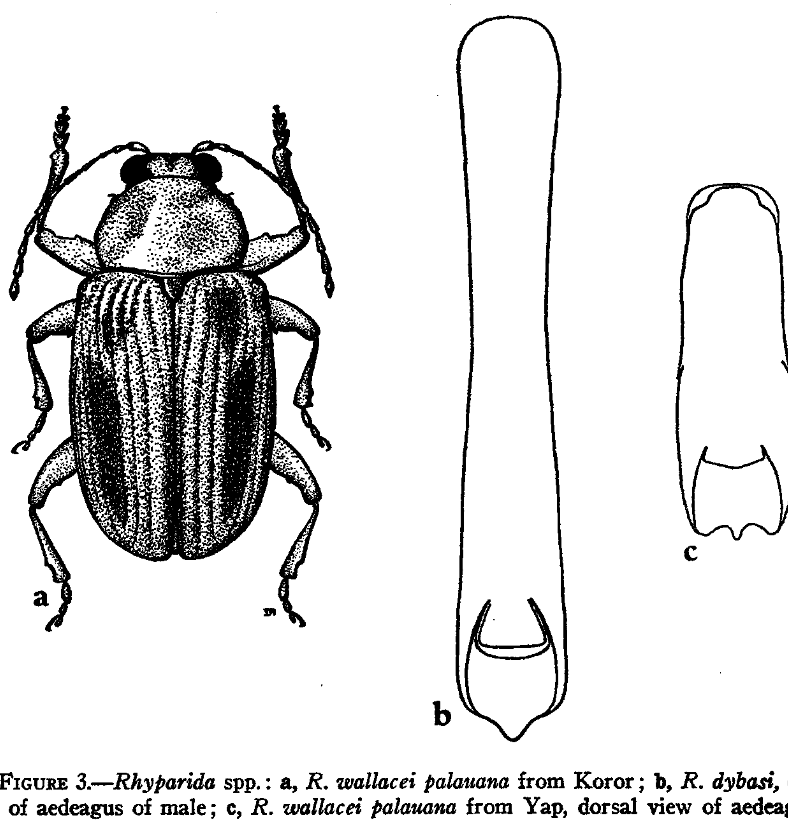


FIGURE 3.—*Rhyparida* spp.: **a,** *R. wallacei palauana* from Koror; **b,** *R. dybasi,* dorsal view of aedeagus of male; **c,** *R. wallacei palauana* from Yap, dorsal view of aedeagus of male.

third. *Prothorax* distinctly narrower than elytra, less than twice as broad as long, practically as broad at apex as at base, suboblong, somewhat convex in outline basally, subrounded at each side; disc feebly convex, fairly even, feebly punctured and also microreticulate. *Elytra* subparallel, each with 11 puncture-rows at middle, both grooves and punctures fairly pronounced; interspaces slightly convex, broader than punctures, and bearing sparse minute punctures. *Ventral surfaces* finely punctured on abdomen, somewhat frosted on thorax. *Legs* stout, with fore and hind femora distinctly, and mid femur feebly, toothed beneath. *Aedeagus* with three terminal teeth, the middle one narrower and less rounded.

Female: Apparently no different from male in elytral structure and legs.

Length 4.5-6 mm., breadth 2.15-3.5 mm.

DISTRIBUTION: Western Caroline Is.

PALAU. BABELTHUAP: Four, Ngiwal, Dec., 1952, April 1953, Beardsley; one, somewhat questionably this species, Ulimang, Dec. 1947, Dybas. KOROR: One, Nov. 1947, Dybas; six, Mar. 1948, K. L. Maehler; two, 1952-1953, Beardsley; four, Limestone Ridge, northeast Koror, Dec. 1952, Gressitt.

YAP. YAP: Four, Ruul District, July-Aug. 1950, Goss; one, between Dugor and Rumu, Nov. 1952, Gressitt; two, Mar. 1954, Beardsley. MAP: One, southern part, July-Aug. 1950, Goss.

HOST: Adults found on *Bruguiera* and *Rhizophora* (mangrove).

This species was described from a single incompletely pigmented male from Koror village. The pigmentation is distinct and uniform in the above series, except for some of those from Babelthuap. A Yap specimen compared with the type of *R. wallacei* Baly, from Sarawak, appeared extremely close, if not identical. Possibly the two are part of a *Rassenkreis* which may be also represented in Mindanao. A Guadalcanal specimen in Bishop Museum is also extremely similar.

7. **Rhyparida dybasi** Gressitt, n. sp. (fig. 3, *b*).

Male: Ochraceous to dull testaceous; head reddish brown on frons and labrum, more orange on occiput; mandibles black; palpi testaceous; antennae dull testaceous, more reddish distally; prothorax reddish castaneous, slightly darker on disc except for median line and borders; scutellum castaneous; elytra dull testaceous with puncture-rows darker; ventral surfaces dirty testaceous to somewhat pitchy; legs dull testaceous, slightly reddish on tarsi and bases of tibiae. Body glabrous above, and with fine, scattered pale hairs beneath and on parts of legs.

Head moderately punctured on frons, less distinctly so on occiput, with two punctures on labrum; occiput with sides bordered by a groove anteriorly, and with a short median groove near apex; eye moderately emarginate, slightly wider than distance from other eye. *Antenna* over one-half as long as body, moderately slender; pedicel much smaller than scape, two-thirds as long as third segment; fifth and following more hairy, and very slightly thicker, than third and fourth. *Prothorax* distinctly narrower than elytra, slightly narrower at apex than at base, not quite twice as broad as long, strongly rounded at sides; disc moderately convex, rather smooth and shiny, with fine scattered punctures. Scutellum smooth, subparallel-sided and broadly rounded-obtuse apically. *Elytra* subparallel-sided, moderately long; each with 11 puncture-rows just before middle, the grooves narrow and shallow, in part more pronounced posteriorly, and the punctures mostly small, largest in post-basal depression, and smaller posteriorly; interspaces feebly convex basally, much

broader than punctures, and bearing vague, scattered, minute punctures. *Ventral surface* slightly wrinkled or striate on abdomen, minutely frosted on thorax. *Legs* moderately stout; fore and hind femur each with a minute tooth just beyond middle of under side. *Aedeagus* long and slender, apex with a single broad-based obtuse process. Length 6 mm., breadth 3.3 mm.

Female: Dorsum more reddish and shiny. Length 5.8 mm., breadth 3.2 mm.

Paratypes: Length 5-6.8 mm., breadth 3.2-3.5 mm.

Holotype, male (US 62411), Ngerehelong, northern peninsula of Babelthuap, Palau, Dec. 18, 1947, H. S. Dybas; allotype, female (US), Ulimang, northeast Babelthuap, Dec. 16, 1947, Dybas; paratype, male (BISHOP), Melekeiok, east Babelthuap, Oct. 8, 1951, Gressitt; seven paratypes (US, BISHOP, BM, and TT), Koror, Apr.-May 1949, Langford, Imeliik (Aimeliik), southwest Babelthuap, Aug. 26, 1953, Beardsley.

DISTRIBUTION: Northern Palau.

Differs from *R. illaesa* Weise, of the southern Philippines, in having the frons more heavily punctured, the prothorax more shiny with the bristle-bearing tubercle at each anterior angle less strongly raised, and the elytra with the punctures weaker and the last two puncture-rows merged for a longer distance in the middle.

8. Rhyparida carolina carolina Chujo.

Rhyparida carolina Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 282, fig. 1 (Kusaie, Ponape; type: Kusaie, in Taiwan Agric. Res. Inst.).

Reddish ochraceous, sometimes largely testaceous, or in part slightly pitchy; head darkened along median area of occiput and behind eyes; pronotum with a large, vaguely bordered darkened area on each side on disc; ventral surfaces ochraceous or testaceous.

Head with frons deeply emarginate apically and rather deeply punctured; eye bordered behind by a groove; occiput emarginate and grooved apically, sparsely punctured. *Antenna* more than one-half as long as body, slender, gradually and slightly thickened distally. *Prothorax* twice as broad as long, slightly narrowed apically, unevenly rounded at side and widest near base; disc evenly convex, somewhat finely, but deeply, and irregularly punctured, the punctures dense on parts of side. *Elytra* not much broader than prothorax, subparallel but short; each with 11 rows of distinct punctures which are not in distinct grooves, the interspaces much wider than punctures and feebly convex. *Ventral surfaces* feebly punctured or nearly smooth. *Femora* without ventral teeth. Length 4-5.8 mm., breadth 2.3-3.3 mm.

DISTRIBUTION: Eastern Caroline Is.

KUSAIE. Many, Lele I., Aug. 1946, Oakley, Mt. Tafeyät [Tafeayat], Mt. Buache [Matante], Aug. 1946, Townes; Kusaie, July 1947, Langford; Lelu I., Feb., Mutunlik, Feb.-Mar., "Hill 541," March, "Hill 1010," Apr., Mwot, Apr. 1953, Clarke; Mt. Fenkol [Fuinkol] and Matanluk [Mutunlik], Jan. 1953, Gressitt.

HOSTS: "Various species of plants," Langford.

9. Rhyparida carolina ponapeana Gressitt, n. subsp. (fig. 4).

Rhyparida carolina Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3) : 283 (part : Ponape I.).

Male: Dark reddish castaneous to pitchy black; head brown with palpi testaceous, labrum red, frons pitchy and postocciput and median line of occiput nearly black; antenna ochraceous, duller in distal half; pronotum dark reddish castaneous, slightly paler near borders; scutellum slightly darker; elytra castaneous, darker on humerus and behind humeral area; ventral surfaces castaneous to pitchy; legs ochraceous, with a black ring before apex of each femur and apices of tibiae somewhat darkened. Body glabrous above, with a few erect pale hairs beneath.

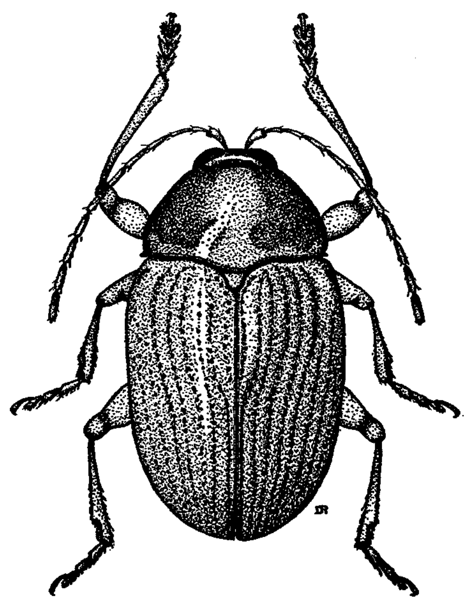


FIGURE 4.—*Rhyparida carolina ponapeana*, allotype, female.

Head with labrum long; clypeus deeply emarginate apically with emarginate margins finely punctured and remainder subcoarsely punctured; occiput emarginate and briefly grooved apically, and grooved on margins bordering eyes. *Antenna* nearly two-thirds as long as body, slender; terminal segments slightly broadened and flattened. *Prothorax* more than twice as broad as long, narrowed apically, obtusely rounded at each side; disc evenly and feebly convex, subfinely and irregularly punctured. *Elytra* with puncture-rows not grooved, the punctures subregular and not very large, largely behind base and becoming much smaller apically; interspaces feebly raised, finely and sparsely punctulate. *Ventral surfaces* smooth, feebly frosted on thorax and slightly wrinkled on abdomen. *Legs* robust; femora not toothed. Length 5.7 mm., breadth 3 mm.

Female: Head black on upper portions of frons and occiput, sides of pronotal disc and metepisternum; elytra ochraceous. Length 6 mm., breadth 3.7 mm.

Paratypes: Mostly dark castaneous with pronotum pitchy black; varying to entirely pitchy black or rarely to testaceous with reddish pronotum. Length 4.5-6.5 mm., breadth 2.7-3.9 mm. Average length about 5.6 mm.

Holotype, male (US 62410), Mt. Tamatamansakir [Temwetemwensekir], summit (479 m.), Ponape, Mar. 23, 1948, H. S. Dybas; allotype, female (US), Mt. Kupuriso [Kupwuriso], at about 400 m., Ponape, Mar. 8, 1948, Dybas. Many paratypes (US, CM, MCZ, BISHOP, BM, KU), Ponape, Colonia, Metalanim [Madolenihm] and Kiti, Aug. 1946, Oakley; Hydroelectric Plant (Colonia-Nanipil), Aug. 1946, Townes; Colonia, Nanpil [Nanipil], Mt. Tamatamansakir [Temwetemwensekir], Mt. Nanalaud and Mt. Kupuriso, Feb.-Mar. 1948, Dybas; Metelanum [Madolenihm], May 1948, Langford; Colonia, Jan. 1949, M. M. Ross; Mt. Tolenrahkiet, July 1949, Glassman; Agric. Exper. Sta. (Colonia), Peipalap [Paipalap] Pk., Sokehs I., Airfield No. 2 (near Palikir), Mt. Tamatamansakir [Temwetemwensekir], Matalanim [Madolenihm], June-Sept. 1950, Adams, Jokaj [Sokehs] I., and Nanpohnmal, Jan. 1953, Clarke; southeast of Nanpohnmal, Mt. Temwetemwensekir, and Mt. Nahnalaud (summit, 787 m.), Jan. 1953, Gressitt; Colonia, Nov. 1953, Beardsley. One, Ponape, 1927, S. Uchiyama, from Agric. Exper. Sta. coll.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

HOSTS: *Pandanus* crowns; *Hibiscus tiliaceus,* mango and other trees; also possibly coconut and taro.

This species differs from *R. carolina carolina* in being larger, more shiny and more heavily pigmented, generally with the pronotum entirely dark and very rarely with two distinct dark marks, and with the second complete puncture-row from suture having about 50 punctures, instead of about 45. This is one of the most common insects on Ponape, found from the coasts to the highest summits.

10. Rhyparida carolina trukana Gressitt, n. subsp. (fig. 5, *a*, *b*).

Male: Reddish brown; head pitchy on postocciput and median line of occiput; antennae ochraceous; pronotum reddish; elytra reddish ochraceous; ventral surfaces and legs testaceous to slightly pitchy.

Head finely punctured and micropunctulate on frons and occiput, briefly grooved at apex of occiput. *Antenna* slender, second segment nearly as long as third. *Prothorax* more than twice as broad as long, narrowed apically, subevenly rounded laterally; disc slightly uneven at sides, finely and distinctly punctured. *Elytra* short, slightly narrowed from behind humeri; each with punctures moderate, not in grooves, and with about 40 punctures in second complete row from suture; interspaces feebly raised, with a few minute punctures, about twice as wide as punctures behind humerus. *Ventral surfaces* smooth to finely frosted. *Femora* untoothed. Length 4.5 mm., breadth 2.6 mm.

Female: Uniformly reddish brown except for darkened occiput and metepisternum. Length 5.2 mm., breadth 3 mm.

Paratypes: Rarely pale reddish or ochraceous. Length 4.2-5.3 mm., breadth 2.6-3 mm.

Holotype, male (US 62412), Tol [Ton] Island, Truk, Jan. 1949, Langford; allotype, female (US), Mt. Unibot, Tol [Ton] I., under bark of dead *Artocarpus*, Dec. 31, 1952, Gressitt. Eleven paratypes (BISHOP, CM, CAS, BM), Civ. Ad. Area (Nantaku), Moen [Wena] I., Mar.-Apr. 1949, Potts,

May 1952, Beardsley; Mt. Unibot, Tol [Ton] I., Dec. 1952-Jan. 1953, mostly in light trap and under dead breadfruit bark, Gressitt.

DISTRIBUTION: Truk.

This species differs from *R. carolina carolina* in averaging slightly smaller and darker, uniformly reddish brown without dark spots on the pronotum, and in having about 40 punctures, instead of about 45, in second complete puncture-row from suture.

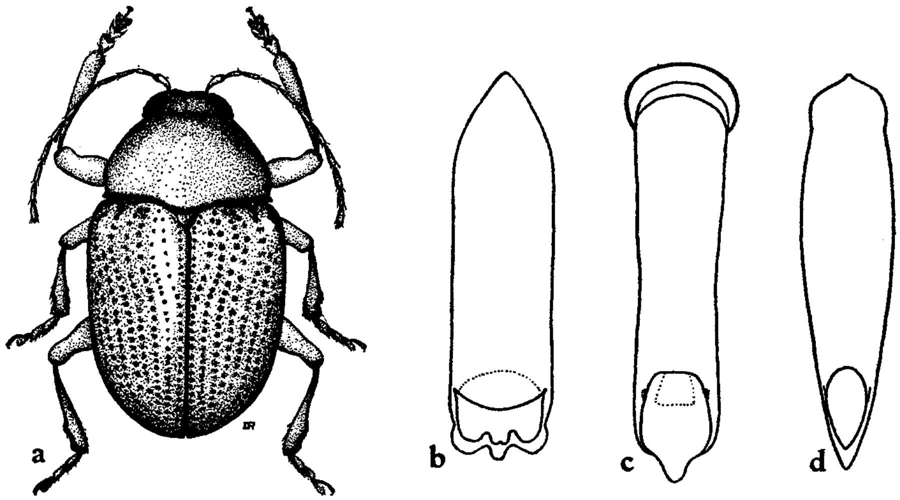


FIGURE 5.—**a,** *Rhyparida carolina trukana,* holotype, male; **b,** dorsal view of aedeagus of *R. c. trukana;* **c,** *Phytorus lineolatus* from Guam, dorsal view of aedeagus; **d,** *Colaspo-soma metallicum rugiceps* from Guam, dorsal view of aedeagus.

Genus **Phytorus** Jacoby

Phytorus Jacoby, 1884, Mus. Civ. Stor. Nat. Genova, Ann. **20**: 226 (type: *P. dilatatus* Jacoby; Java, Singapore).—Lefevre, 1885, Soc. Sci. Liege, Mem. II, **11**: 133.

This genus is easily confused with *Rhyparida*; and it might have to be relegated to subgeneric standing, although the two have been placed in separate tribes. Most of the species are Philippine.

11. Phytorus lineolatus Weise (fig. 5, *c*).

Phytorus lineolatus Weise, 1913, Philippine Jour. Sci. **D8** (3): 220 (Batan; type destroyed).

Eumolpid, Vandenberg, 1929, Guam Agric. Exper. Sta. Rept. for 1927, 16.

Phytorus pinguis, Vandenberg, 1930, Guam Agric. Exper. Sta. Rept. for 1928, 30.—Swezey, 1940, Hawaiian Planters' Rec. **44** (3): 170.

Phytorus lineolatus ?, Swezey, 1942, B. P. Bishop Mus., Bull. **172**: 171.

Reddish ochraceous brown, slightly shiny; antennae and palpi a little paler.

Head narrower than prothorax, smooth, with fine punctures and a sinuous division between frons and occiput, the latter with a shallow median groove. *Antenna* slender; third to last segments subequal; second much shorter. *Prothorax* fully twice as long as broad, narrowed apically and subevenly rounded at sides, evenly convex and feebly punctured. *Elytra* subevenly convex; each hardly depressed behind humerus, with 11 puncture-rows at middle, the grooves fine and the punctures small and laterally compressed, the interspaces broad, feebly convex and feebly micropunctulate; penultimate puncture-row short, just behind humerus, distinctly arched, with 8 or 9 punctures, and free or merging with last row. Only hind femur with a small ventral tooth. Length 4.4-6.2 mm., breadth 3-4 mm.

DISTRIBUTION: Luzon, southern Mariana Is.

S. MARIANA IS. TINIAN: July 1949, Mead; Sept. 1949, Langford; June 1952, Kondo; Nov. 1952, Beardsley. AGIGUAN: June 1952, Kondo; on *Pipturus*, June 1952, Peterson. GUAM: Many, Talofofo, Tiyan, Ritidian, Yona, Piti, Agana, Upi Trail, Dededo, Inarajan, Umatac, Agat, Merizo, Sinajana, Mt. Alifan, Dandan, Orote Pen., Yigo, Tuman, Swezey and Usinger; Amantes Pt., Fadang, etc., May 1945, Dybas; Pt. Oca, Mt. Santa Rosa, Pt. Taguan, etc., May 1945, G. Bohart and Gressitt; Asan, Dec. 1945, Barrigada, Mt. Lamlam, Nov. 1952, Gressitt; Talofofo, Dec. 1948, Maehler; Mt. Alifan, Apr. 1946, Northwest Airfield, etc., Aug. 1952, Krauss; Machanao, Sept. 1949, Kondo and Mead; Agana, Oct. 1952, Beardsley.

HOSTS: Mango, *Hibiscus tiliaceus*, bamboo, *Pithecellobium dulce*, *Cycas*, *Ochrosia*, *Barringtonia racemosa*, *Thespesia populnea*, *Hernandia peltata*, *Macaranga*, *Glochidion*, *Pipturus*, *Punica granatum*, *Citrus*, *Mallotus*, *Ficus*, *Terminalia catappa*, *Nephrolepis biserrata*, maize, coconut, breadfruit, taro, grape, soursop, avocado, orange. It is not certain that all these plants are fed upon, but the host range is evidently very wide.

This species is said by Swezey (1940) to have been introduced to Guam about 1925; Vandenberg (1929) merely states that it was first seen then. It was probably recently introduced from Guam to Tinian and Agiguan. From the literature, it is not clear whether this species was described from Bataan Island in Manila Bay or the Batanes Islands, north of Luzon. Specimens from central Luzon agree with the Guam material.

TRIBE EUMOLPINI

Genus **Colasposoma** Laporte

Colasposoma Laporte, 1833, Silberm. Rev. Ent. **1**: 22 [type: *C. senegalense* (Dejean) Laporte; Africa].—Jacoby, 1906, Fauna of India, Col. Chrys., 439.

Convex, broad, and oblong; metallic, heavily punctured; head short and flat in front; prothorax very broad; legs robust; femora swollen; tibiae ridged, broadened apically; prosternum broad, flat, pubescent.

This genus is well represented in Africa and continental Asia, but is otherwise absent on oceanic islands. There are several species in the Philippines, and one in Celebes. The following is an introduction.

12. Colasposoma metallicum rugiceps Lefevre (fig. 5, *d*).

Colasposoma rugiceps Lefevre, 1885, Soc. Sci. Liege, Mem. II, **11**: 106, note 2 (Luzon; type in Mus. Bruxelles).

Bronzy, tinged with metallic green; reddish on ventral surface of basal half of antenna and on tarsal claws.

Head deeply and closely punctured, partly in oblique rows on sides of occiput; eye small, strongly convex. *Antenna* more than one-half as long as body, slender except for considerably thickened scape and last five segments. *Prothorax* practically as broad as elytra, more than twice as broad as long; anterior margin nearly straight; lateral margin rounded-obtuse; disc convex, closely and deeply punctured, the punctures closer at sides, in part forming oblique rows. Scutellum with several distinct punctures on central portion. *Elytra* convex, slightly depressed behind base, distinctly, and not very regularly, punctured, the punctures larger laterally. *Ventral surface* finely punctured or sculptured; tibiae strongly ridged. Length 5.8-6.3 mm., breadth 3.6-4 mm.

The female has the middle portion of the side of each elytron coarsely rugulose in a principally vertical manner, whereas in the male this portion is scarcely rougher than the disc.

DISTRIBUTION: Luzon, Guam.

S. MARIANA IS. GUAM: Mangilao, Nov. 1951, Peterson; Mt. Bolanos, Aug. 1952, Krauss; Tamuning, Sept. 1952, O'Lien; Agana and Yona, Oct. 1952, Krauss; Agana, Oct. 1952, Beardsley; between Pt. Oca and Tumon Bay, and Barrigada, Nov. 1952, Gressitt.

HOSTS: Feeds on sweet potato (*Ipomoea*). Found also resting on maize leaves and weeds in fields.

This species was first found on Guam in 1951, and is now abundant in the central portion, at least. It probably came from Luzon by air transport. Possibly it came from Okinawa, in which case it would be *C. metallicum oberthüri* Jacoby. These forms are all very close to *metallicum,* and I am relegating them to subspecific relationship. P. Jolivet kindly compared a Guam specimen with the type and found them almost identical.

TRICHOSTOMES

Antennae closely inserted on front of head, fragile; prosternum narrow; elytra often not very rigid.

SUBFAMILY GALERUCINAE

Anterior coxa conical apically; hind femur generally not strongly swollen, lacking an endoskeletal structure associated with jumping habit. Larvae often live exposed on plant leaves, sometimes partly covered with feces.

Genus **Aulacophora** Duponchel and Chevrolat

Aulacophora Duponchel and Chevrolat, 1842, IN d'Orbigny, Dict. Univ. Hist. Nat. **2**: 337 (type: *Galleruca quadraria* Olivier; Europe).—Maulik, 1936, Fauna of India, Col. Chrys. Galeruc., 169.—Hincks, 1949, Ann. Mag. Nat. Hist. XII, **2**: 609; 1950, XII, **3**: 87.

Raphidopalpa Chevrolat, 1845, IN d'Orbigny, Dict. Univ. Hist. Nat. **6**: 5 (type: *Crioceris abdominalis* Fabricius; Europe).—Hincks, 1949, Ann. Mag. Nat. Hist. XII, **2**: 620; 1950, XII, **3**: 88.

Rhaphidopalpa Rosenhauer, 1856, Thiere Andalus., 325 (type: *Galleruca foveicollis* Lucas; Europe).—Weise, 1924, Coleopt. Cat. **78**: 7.

Ceratia Chapuis, 1876, Soc. Ent. Belgique, C. R. **19**: C.—Weise, 1924, Coleopt. Cat. **78**: 9.

Orthaulaca Weise, 1892, Deutsche Ent. Zeitschr. **1892**: 392 (type: *Galeruca similis* Olivier); 1922, Tijdschr. Ent. **65**: 205; 1924, Coleopt. Cat. **78**: 11.

Body flattened and suboblong, often broadened posteriorly. Antenna slender, sometimes with some segments broadened in males. Pronotum generally transversely oblong with a sinuous or transverse groove across disc behind middle. Legs fairly slender. Generally feeds on Cucurbitaceae.

Key to Micronesian Species of Aulacophora

1. Elytra partly, or entirely, testaceous on discs 2
   Elytral discs entirely black or metallic 4

2(1). Elytra not entirely pale, heavily marked with black 3
   Elytra entirely pale; pronotum with a sinuous groove which is enlarged and deepened at center; posthumeral area of male with dense pale pubescence; last sternite of female deeply emarginate .... **similis**

3(2). Elytral black bands widely separated, basal band covering humeri; antennae and legs pale; prothorax sinuous at sides; pronotum in part deeply grooved .... **quadrimaculata**
   Elytral black bands fused, not covering humeri; antennae and legs partly dark; prothorax obtuse at sides; pronotum with groove reduced to three shallow depressed areas .... **hayashii**

4(1). Elytral margins partly pale; occiput and antenna pale; antenna of male modified 5
   Elytral margins not partly pale; occiput and antenna dark; antenna of male simple 6

5(4). Elytra metallic green with external margins ochraceous from behind humeri to sutural angles; third to fifth antennal segments distinctly flattened .... **marginalis**
   Elytra black with external margins testaceous from base to beginning of apical quarter; third to fifth antennal segments thickened distally, but not conspicuously flattened .... **flavomarginata**

6(4). Pronotum, front of head, and ventral surfaces pale testaceous; elytra black with a somewhat purplish tinge; elytral margins somewhat broadly expanded; pronotal groove nearly straight .... **coralinsula**
   Body almost entirely black; dorsum with a metallic greenish tinge; elytral margins narrow; pronotal groove nearly reaching base at middle .... **mariana**

13. Aulacophora marginalis Chapuis.

Aulacophora (Ceratia) marginalis Chapuis, 1876, Soc. Ent. Belgique, C. R. **19**: C (Bohol, type in Mus. Bruxelles).

Aulacophora marginalis, Allard, 1888, Soc. Ent. France, Ann. VI, **8**: 311.—Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 293, figs. 6, 6 a.

Orthaulaca (Ceratia) marginalis Weise, 1892, Deutsche Ent. Zeitschr. **1892**: 398; 1924, Coleopt. Cat. **78**: 10.

Male: Pale ochraceous; antenna testaceous distally; elytra metallic bluish green, narrowly bordered externally, from behind humeri, with testaceous; fore and middle femora reddish; tarsi and tibiae (except bases) black.

Head sparsely hairy anteriorly, smooth and shiny on occiput, with a few slight wrinkles at sides. *Antenna* two-thirds as long as body; scape long and slender; second segment short; third flattened, acute apically; fourth shorter, flattened, triangular; fifth subequilaterally triangular, concave distally above; rest slender. *Prothorax* transverse, feebly convex in outline of base, slightly sinuate laterally, broadest anterior to middle; disc feebly punctured except near anterior angles, with a broad shallow transverse depression behind center. *Elytra* broadened to well behind middle; each with margin slightly expanded and disc shallowly but distinctly punctured and also micropunctulate. *Ventral surfaces* finely punctured; last abdominal sternite with median terminal process slightly broader than long, bilobed distally, slightly concave, cleft at sides for two-thirds length of segment.

Female: Antenna pale and fairly slender beyond pedicel; last abdominal sternite entire, barely emarginate at center.

Length 5-7.5 mm., breadth 3-3.7 mm.

DISTRIBUTION: Philippines, western Caroline Is.

PALAU. NGAIANGL (Kayangel Atoll): Sept. 1951, Gressitt; Dec. 1952, Beardsley and Gressitt. KOROR: July 1940, Matusita; northeast corner, July 1946, Townes; Aug. 1953, Beardsley. NGERGOI (Garakayo): Aug. 1945, Dybas. PELELIU: July 1945, Hagen and Dybas. ANGAUR: Feb. 1948, Dybas.

HOSTS: Various kinds of cucurbits, including squash and *Luffa.*

This species was taken on Koror and Ngaiangl in 1938 by Esaki. It seems to prefer limestone areas.

14. Aulacophora flavomarginata Duvivier.

Aulacophora flavomarginata Duvivier, 1884, Leyden Mus., Notes **6**: 119 (Sunda Is.; type in Mus. Bruxelles).—Allard, 1888, Soc. Ent. France, Ann. VI, **8**:311.—Esaki, 1937, Akitu (Kyoto) **1** (1): 6, pl. 1.—Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 288, figs. 4, 4 a.

Ceratia flavomarginata, Weise, 1892, Deutsche Ent. Zeitschr. **1892**: 397; 1922, Tijdschr. Ent. **65**: 59.

Male: Testaceous, slightly orange on pronotum and top of head; elytra shiny black, with external margins, except posteriorly, testaceous.

Head narrower than prothorax; occiput fairly smooth and shiny, but finely punctured, depressed between vertex and occiput. *Antenna* two-thirds as long as body; scape fairly

short, about as long as third segment; third slightly broadened and oblique distally; fourth thicker and more acute distally; fifth much shorter, broad, truncate apically; following slender. *Prothorax* transverse, fairly straight before and behind; sides sinuate, broadest anterior to middle; disc convex, feebly punctured, except near anterior angles, crossed by a fairly deep transverse groove just behind center. *Elytra* slightly broadened posteriorly; each with margin somewhat expanded and disc finely punctured. *Ventral surfaces* finely punctured and somewhat hairy; last abdominal sternite with median process oblong, somewhat narrowly grooved medially for entire length, cleft on each side nearly to base of segment.

Female: Antenna simple; third to sixth segments gradually and slightly thickened distally; fifth shorter than fourth and sixth; third slightly longer than fourth. Last abdominal sternite entire, slightly sinuate at extreme apex.

Length 5-6.2 mm., breadth 2.7-3 mm.

DISTRIBUTION: Sunda Islands, Celebes (?), Philippines, western Caroline Is.

PALAU. BABELTHUAP: Several, Ulimang and wooded peak southwest of Ulimang, Dec. 1947, Dybas; Ngiwal, Aug. 1951, Gressitt, Dec. 1952, Beardsley and Gressitt; Ollei, Irrai District, May 1953, Beardsley. Taken in northern Babelthuap in 1936 by Esaki. KOROR: Several, July 1940, Matusita.

HOSTS: Cucurbits.

15. **Aulacophora coralinsula** Gressitt, n. sp. (fig. 6).

Male: Testaceous; occiput pitchy black; eye black; antenna pitchy brown, paler on basal portion of scape; elytra shiny black; metasternum ochraceous; legs somewhat brownish on tarsi and outer portions of tibiae, reddish ochraceous on middle of femur. Body glabrous above, finely clothed beneath with suberect golden buff hairs.

Head as broad as prothorax; labrum large, in part punctured, almost as long as frons, which is ridged medially and very finely punctured; eye large; vertex grooved medially and separated from occiput by a transverse groove with a deeper cavity at center;

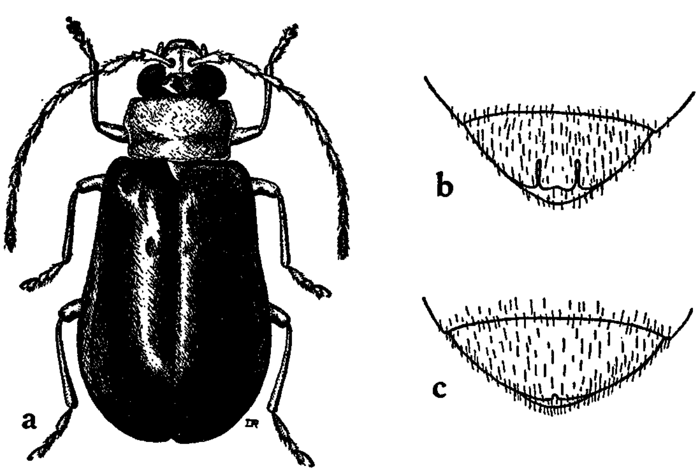


FIGURE 6.—*Aulacophora coralinsula:* **a**, allotype, female; **b**, ventral view of end of abdomen of male; **c**, ventral view of end of abdomen of female.

occiput smooth and shiny, impunctate except anteriorly where there are minute punctures and wrinkles at each side. *Antenna* nearly four-fifths as long as body; scape slender, arched, about as long as third segment; second very short; fourth and fifth subequal, each distinctly shorter than third and sixth; sixth to last equal in length and similar, except last which is tapering and acute at apex. *Prothorax* about twice as broad as long, straight anteriorly and slightly convex basally in dorsal outline; sides slightly sinuate, distinctly narrowed basally, broadest between middle and apex; disc shiny, very finely and sparsely punctured, except for some deeper and closer punctures slightly above anterior angles, crossed by a fairly straight broad groove of moderate depth behind center, the groove a little shallower at middle. Scutellum triangular, blunt behind, longer than broad. *Elytra* slightly broadened posteriorly, widest a little behind middle; each shiny, finely punctured and slightly depressed on inner portion just behind basal quarter; external border only slightly expanded. *Ventral surfaces* fairly shiny, finely and rather regularly punctured; last abdominal sternite trilobed, the median lobe about one-half as long as sternite, slightly broader than long, subobtusely emarginate apically. *Legs* slender; tibiae finely toothed apically; first hind tarsal segment nearly as long as remaining segments combined. Length 5.3 mm., breadth 2.6 mm.

Female: Pronotum, scutellum, front portion of head, scape, and fore and middle femora whitish testaceous; hind femur slightly brownish in middle; elytra with postbasal depression not very distinct; last abdominal sternite entire, rounded-truncate distally. Length 6.3 mm., breadth 3.5 mm.

Paratypes: One male has the occiput brownish. The pale areas vary from whitish testaceous to ochraceous. Length 5.2-6.2 mm., breadth 2.6-3.5 mm.

Holotype, male (US 62566), Aurapushekaru [Ulebsehel] I., central Palau, Jan. 13, 1948, H. S. Dybas; allotype, female (US), ridge at north end of Peleliu I., Jan. 30, 1948, Dybas; two male paratypes (BISHOP), Auluptagel [Ulebsehel] (actually Ngarmalk, west of Ulebsehel), Sept. 1952, Krauss, "NW Auluptagel" [Ngarmalk], Dec. 13, 1952, Gressitt; paratopotype, female (Chicago), Jan. 14, 1948, Dybas.

DISTRIBUTION: Southern Palau.

HOST: Swept from herbs, probably other than cucurbits.

This species differs from *A. flavomarginata* in having the occiput black, the antennae largely dark, the tibiae and tarsi somewhat dark, the elytra entirely black, the antennae of male simple, the pronotum less convex and more shallowly grooved. In the male, the last abdominal sternite is lobed for only one-half its length and the median lobe is flat instead of medially grooved. This species has been found on coral islands only, whereas *flavomarginata* has been taken on volcanic islands only.

16. **Aulacophora mariana** Chujo (fig. 7, *a*).

Aulacophora mariana Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 291, fig. 5 (Rota; type in Taiwan Agric. Res. Inst.).

Male: Shiny black with a slight metallic tinge, marked with brownish on distal part of head, scutellum, humerus (a transverse spot near middle of each elytron), and bases of femora; ventral surfaces and legs brownish black.

Head as broad as prothorax, minutely punctured except for a transverse row of pores on labrum; eyes large. *Antenna* nearly as long as body, slender; segments cylindrical, subequal in length except for second, which is less than one-third as long as others.

Prothorax transverse, sinuate at sides, broadest slightly anterior to middle; disc feebly punctulate, with a transverse depression behind middle which is slightly enlarged at center. Scutellum subequilateral, blunt behind. *Elytra* broadest behind middle, feebly punctulate. *Ventral surfaces* finely punctured and somewhat hairy; last abdominal sternite with a terminal squarish process, on each side of which it is deeply and narrowly emarginate. *Legs* slender. Length 6.5 mm., breadth 3.4 mm.

Female: Head not quite as broad as prothorax; antenna four-fifths as long as body; last abdominal sternite broadly rounded-truncate at apex. Length 7.6-8 mm., breadth 3.9 mm.

DISTRIBUTION: Southern Mariana Is.

S. MARIANA IS. ROTA: The type was described from Sonson-Sabana; taken in 1937 by Esaki. GUAM: Two (US), sweeping, near Tweeds Cave, northwest Guam, Feb. 1, 1948, Maehler; one male (in Honolulu Quarantine coll.), Haputo Pt., Feb. 1, 1948, Maehler. Since this species was not taken on

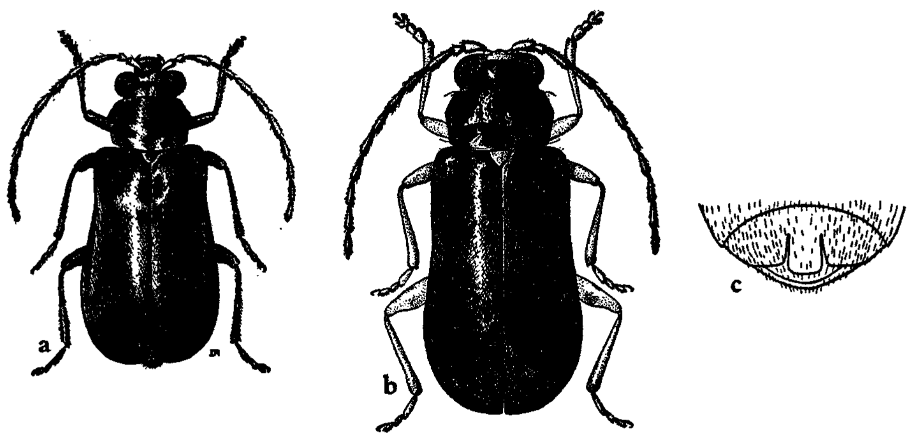


FIGURE 7.—**a,** *Aulacophora mariana,* male from Guam. **b, c,** *Aulacophora hayashii: b,* holotype, male; *c,* ventral view of end of abdomen of male.

Guam by earlier collectors, it may possibly have been introduced from Rota since the war, or it may be rare and limited to the northern limestone forests.

17. Aulacophora quadrimaculata (Fabricius).

Crioceris quadrimaculata Fabricius, 1781, Spec. Ins. **1**: 152 ("Cape of Good Hope"; type in British Mus.).

Aulacophora quadrimaculata Maulik, 1929, Insects of Samoa **4** (3): 194.—Esaki, 1937, Akitu (Kyoto) **1** (1): 5, pl. 2 (Saipan); 1940, Bot. Zool. Tokyo **8**(1): 278.—Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 295, fig. 7 (Tinian, Rota).—Esaki, 1952, Ninth Int. Congr. Ent., Amsterdam, Trans. **1**: 817.

? *Galleruca austrocaledonica* Montrouzier, 1861, Soc. Ent. France, Ann. IV, **1**: 299 (New Caledonia).

? *Aulacophora tetrastictoptera* Lea, 1924, Queensland Mus., Mem. **8**: 50.

Male: Testaceous, slightly more ochraceous on pronotum, marked with black on hind portion of head, except median line, with a large basal and a large subapical black area on each elytron, together forming more or less of a basal and a preapical transverse band; ventral surfaces with most of metasternum and abdomen black.

Head slightly hairy in front, smooth and shiny behind, with a distinct groove separating vertex from occiput. *Antenna* nearly three-fourths as long as body; scape relatively slender; third segment slightly thickened distally; fourth strongly produced and acute ectoapically; fifth moderately flattened and produced; sixth and seventh slightly enlarged distally. *Prothorax* transverse, slightly convex in outline of basal margin; sides sinuate, broadest anterior to middle; disc finely and irregularly punctured, with a slightly sinuate, shallow, transverse groove behind center. *Elytra* distinctly broadened to well behind middle, each finely and somewhat closely punctured. *Last abdominal sternite* with median lobe concave almost to base, and cleft on each side two-thirds distance to base.

Female: Antenna slender and simple; fifth segment slightly shorter than third and fourth. Last abdominal sternite entire, barely emarginate at middle of apex.

Length 4.6-6.4 mm., breadth 2.3-3 mm.

Specimens from Yap consistently have the posterior elytral spot reduced and not very closely approaching suture, and thus not forming a band.

DISTRIBUTION: Samoa, Melanesia, Queensland (?), western Micronesia.

S. MARIANA IS. SAIPAN: Many (BISHOP), Garapan, Aspeldeto, Asgonno, Donni, 1941-1942, Matusita. TINIAN: (HSPA and BISHOP), Mar. 1946, Hadden. ROTA: Teteto-Tatacho-Sonson, 1937, Esaki. GUAM: Four, 1911, Fullaway; many, Agana, Agana Spring, and Pt. Oca, May 1945, G. Bohart and Gressitt.

YAP. YAP: Many, Mt. Matade [Madaade], July 1946, Oakley: Gorror [Guror], Mar. 1949, Maehler; Ruul District, 1950, Goss; Yap I., Oct. 1952, Krauss; Mar. 1954, Beardsley. GAGIL-TOMIL: Gagil District, 1950, Goss.

HOSTS: Various kinds of cucurbits.

This species was apparently collected on Guam in 1911, but was not taken by Swezey, Usinger, or Oakley in 1936 through 1938. Esaki (1952) found it in 1936 on Saipan, Tinian, and Rota, and suspected that it had been introduced from Samoa to Saipan during German times. Possibly it became extinct in Guam and was reintroduced from Saipan during 1942-1944. It was first collected on Yap in 1946, but may have been present longer. The Yap population may have a different origin from that of the Marianas.

18. Aulacophora hayashii Gressitt, n. sp. (fig. 7, *b, c*).

Male: Body ochraceous, extensively marked with black or pitchy; head testaceous, pitchy black on occiput and sides of vertex; antenna black with extreme bases and apices of segments pale and scape reddish brown to paler; pronotum pitchy black with anterior border and sides of anterior portion of disc reddish brown and much of basal portion of disc testaceous to brownish; scutellum testaceous; elytra each testaceous with disc largely black—a continuous broad black discal area from extreme base (except at middle) to a short distance before apex, but with a large obtuse indentation to midline on sutural side just before center, and an oblique truncation from suture just before apical declivity to end

of black area—the black area touching inner margin at base, scutellum, and behind middle of suture, and not quite touching external margin before and behind middle; ventral surfaces largely pitchy black with parts of mesosternum and apical portion of last abdominal segment testaceous; legs testaceous with tibiae, first segment of each tarsus, and middle of each femur brownish. Dorsum glabrous except for a few hairs on posterior declivity of elytra; ventral surfaces quite hairy.

Head nearly as broad as prothorax; frons triangular, not distinctly punctured; eye large; vertex and occiput slightly grooved medially and separated by a groove; vertex with a few ridges at each side near eye; occiput sparsely and shallowly punctured and micropunctulate. *Antenna* four-fifths as long as body, stout; scape moderately swollen, subfusiform; third and following segments subequal in length, last four a little more slender, tenth a little shorter. *Prothorax* about twice as broad as long, feebly convex apically and basally in dorsal outline; sides subsinuately obtuse, widest just anterior to middle and narrowest at base; disc somewhat irregularly convex with three widely spaced shallow depressions in a transverse row behind middle; surfaces in large part distinctly, but not very closely, punctured, more closely punctured on each side of central depression and on sides of anterior portion of disc. Scutellum subtrapeziform, about as broad as long, barely emarginate at middle of apex, feebly punctulate. *Elytra* fairly long and subparallel-sided; each distinctly punctured throughout and with external margin not expanded. *Ventral surfaces* finely punctured; last abdominal sternite with median lobe nearly square, flat, and very feebly emarginate apically. *Legs* fairly large; femora flattened; first hind tarsal segment as long as remaining combined. Length 7 mm., breadth 3.2 mm.

Paratype: Length 6.3 mm., breadth 3.1 mm.

Holotype, male (BISHOP), Saipan, "15.8" (Aug. 1940 or Aug. 15, between 1940 and 1942), probably taken by Dengo Matusita; paratype, male (CAS), Rota I., Nov. 25, 1939, Fujishima. Both made available through the kindness of Mr. Nodoka Hayashi, for whom the species is named.

DISTRIBUTION: Saipan and Rota, southern Mariana Is.

Differs from *A. bicolor* (Weber) in being narrower and in having the head, antenna, and pronotum partly blackish and the elytra each with a roughly hour-glass shaped black marking for most of its length, besides having the pronotal groove almost obsolete, and in other characters. Differs from *A. quadrimaculata* (Fabricius) in having longer elytra with unexpanded margins, the prothorax obtuse instead of sinuate at sides, the pronotum with transverse depression nearly obsolete, dark bands of elytra fused, and other characters.

19. Aulacophora similis (Olivier). (Figure 8.)

Galeruca similis Olivier, 1808, Entomologie **6**: 624, no. 93, pl. 2, fig. 23 (East Indies).

Orthaulaca similis, Weise, 1892, Deutsche Ent. Zeitschr. **1892**: 393.

Aulacophora similis, Maulik, 1929, Insects of Samoa **4** (3): 193.—Mishima, 1936, Nara Agric. Exper. Sta., Extra Rept. **5**: 9 (Saipan).—Esaki, 1937, Akitu (Kyoto) **1** (1): 6 (Palau); 1940, Bot. Zool. Tokyo **8** (1): 274.—Chujo, 1943, Taihoku Imp. Univ., Mem. Fac Sci. Agric. **24** (3): 298, fig. 8.

Male: Ochraceous; metathorax, abdomen (except end of last segment), and middle and hind legs black; antenna slightly brownish on third to fifth segments, pitchy on remainder.

Head slightly hairy and finely punctured anteriorly, smooth and glabrous on occiput. *Antenna* three-fourths as long as body, slender except for swollen and somewhat flattened scape; third to last segments subequal in length, third and fourth oblique apically. *Prothorax* transverse, subtrapeziform, broadest slightly behind apex; disc finely and not very closely punctured, convex and with a deep transverse depression which is widened and bent slightly backward at middle. *Elytra* subparallel, slightly broader behind middle; each finely and irregularly punctured and with a large humeral area clothed with fine, erect, pale hairs. *Ventral surfaces* finely, in part closely, punctured; last abdominal sternite with a large concave oblong process, with a deep narrow emargination on each side.

Female: Antenna two-thirds as long as body; scape less swollen; pronotum a little less deeply grooved across disc; elytral humeri not pubescent; last abdominal sternite with a terminal U-shaped emargination between two rounded-triangular lobes.

Length 6-7.5 mm., breadth 2.6-3.6 mm.

Mature larva: Testaceous; head slightly brownish; mandibles blackish; antenna, maxilla, and labium pale. Body slender. Median epicranial suture fairly short; ocellus

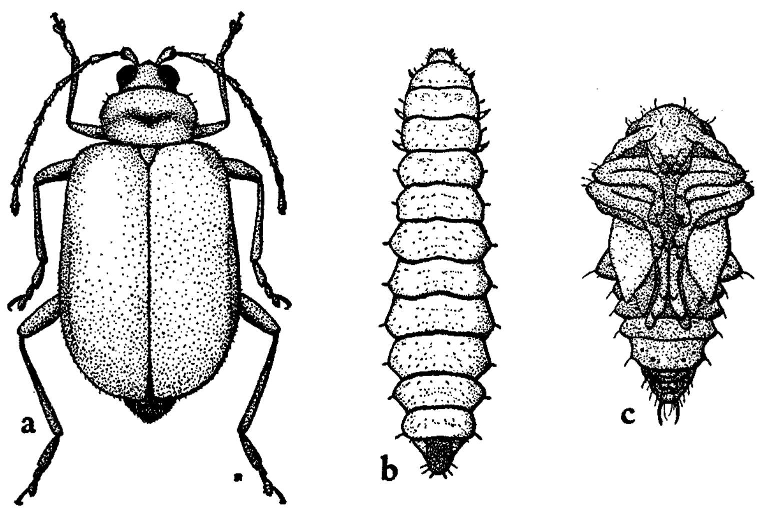


FIGURE 8.—*Aulacophora similis:* **a,** male from Koror; **b,** larva, dorsal view; **c,** pupa, ventral view.

absent; frons with three pairs of fine hairs in two parallel rows; labrum and side of head with several similar hairs, each about as long as antenna. Pronotum rather flat, feebly sclerotized, minutely punctulate, and with a few small pits on each side; three hairs on side of anterior border and three on lateral margin. Mesonotum and metanotum each with transversely elliptical anterior raised area, similar but smaller posterior area and two triangular areas on side of disc, with setae few and very short. Each abdominal tergite with four transverse divisions: first, second, and third with transverse feebly sclerotized areas, and with two obliquely placed subrounded areas on each side, the first, between first and second divisions, near margin, and bearing spiracle, the second obliquely behind and above former; setae few and very short, thickened distally, a longer one near middle of side of each segment. Ninth tergite prolonged, projecting over anus; flat above, reticulate-punctate and with a few hairs on border which are longer than rest of hairs. Each abdominal sternite with three transverse divisions, with some feebly raised areas, most of which

are finely granulose; bearing a very few short hairs. Found feeding on roots of melon vines, Koror, March 1953, Beardsley.

Pupa: Pale testaceous, darker on caudal end of abdomen, which bears a pair of terminal horns, besides stout setae.

DISTRIBUTION: Southeast Asia to Samoa and western Micronesia.

S. MARIANA IS. SAIPAN: Reported by Mishima. TINIAN: On watermelon, Nov. 1952, Beardsley. GUAM: Inarajan, on cucumbers and melons, May 1951, Peterson; Sept. 1951, R. Bohart; Yona and Talofofo, Aug. and Oct. 1952, Krauss.

PALAU. Many (US, CM, BISHOP), NGAIANGL (Kayangel): Dec. 1952, Gressitt. BABELTHUAP: Ngiwal, July 1946, Townes; Gakip [Ngetkip], July 1946, Oakley. KOROR: July 1940, Matusita, July-Dec. 1952, Beardsley. NGERKABESANG (Arakabesan): 1946, Townes. NGERGOI (Garakayo): Aug. 1945, Dybas. PELELIU: July 1945, Dybas and E. Hagen. ANGAUR: Feb. 1948, Dybas.

YAP. YAP: Rull (Ruul), July 1946, Oakley; southern Yap I., July-Aug. 1950, Goss. RUMUNG: eastern part, 1950, Goss.

CAROLINE ATOLLS. SONSOROL: Six (US, BISHOP), Sept. 1952, Krauss. NGAIANGL: Dec. 1952, Gressitt.

HOSTS: Various kinds of cucurbits, including squash, cucumbers, melons, and *Luffa*. Adults feed on flowers and larvae feed on roots.

This species, though taken on Koror in 1936 and on Babelthuap and Angaur in 1938 by Esaki and reported from Saipan in 1936, was not present on Guam before 1946, and perhaps not until about 1950. The series from Sonsorol, Guam, and Tinian appear slightly different from those from Palau; and possibly they had a different geographical origin. Many of the Sonsorol, Guam, and Tinian specimens have a slight process at the middle of the emargination of the last abdominal sternite in the female, which is rare in the Palau series. Females were not taken in Yap.

SUBFAMILY ALTICINAE

Anterior coxa subrounded, not conical apically; hind femur strongly swollen, possessing an endoskeletal structure associated with jumping habit. Larvae often bore in roots of herbs or semiwoody plants.

KEY TO MICRONESIAN GENERA OF ALTICINAE

1. Antenna of nine or 10 segments 2
   Antenna of 11 segments 3

2(1). Antenna of nine segments, last six broadened; body round and somewhat flattened .... **Nonarthra**
   Antenna of 10 segments, fairly long and slender; body elliptical, not flattened; hind tibia produced beyond tarsal insertion .... **Psylliodes**

3(1). Dorsum glabrous; body not less than 1.5 mm. in length........ 4
Dorsum with long erect hairs in rows; body less than 1.5 mm. in length........ **Micrepitrix**

4(3). Body about twice as long as broad; head distinctly visible from above........ 5
Body nearly round in dorsal outline; head largely hidden from above........ 6

5(4). Pronotum not transversely grooved near base; first hind tarsal segment about half as long as tibia........ **Aphthona**
Pronotum distinctly grooved parallel to base; first hind tarsal segment much less than one-half as long as tibia........ **Altica**

6(4). Antennal scape not as long as next five segments combined........ 7
Antennal scape about as long as next five segments combined; sides of frons grooved for reception of antennae........ **Schenklingia**

7(6). Body ovate; hind femur fusiform........ **Sphaeroderma**
Body hemispherical; hind femur very broad, triangular........ **Argopistes**

Genus **Aphthona** Chevrolat

Aphthona Chevrolat, 1842, IN d'Orbigny, Dict. Univ. Hist. Nat. **2**: 5 (type: *Altica cyparissiae* Koch; Europe).—Chapuis, 1874, Gen. Col. **11**: 72.—Maulik, 1926, Fauna of India, Col. Chrys. Halt., 366.

Cerataltica Crotch, 1873, Acad. Nat. Sci. Philadelphia, Proc. **1873**: 73 (type: *Sphaeroderma ? insolita* Melsheimer).

Narrowly ovate; head visible from above; pronotum convex, without grooves; elytra hardly punctured; first hind tarsal segment nearly as long as following combined.

This is a large genus which is almost cosmopolitan. In Oceania it extends outward to Fiji and central Micronesia.

Key to Micronesian Species of Aphthona

1. Size 2.7-3.5 mm. in length; aedeagus with a pair of dorsal submarginal grooves and with apex attenuated and with a terminal narrow rounded-oblong process projecting somewhat ventrally........ **bicolorata**
Size 1.9-2.25 mm. in length; aedeagus with a deep median dorsal groove and with apex abbreviated and rounded-truncate, without a terminal process........ **nanyoensis**

20. **Aphthona bicolorata** Jacoby (fig. 9, *a*).

Aphthona bicolorata Jacoby, 1904, Mus. Civ. Stor. Nat. Genova, Ann. **41**: 487 (Paumomu R., New Guinea; type in Genova Mus.).

Male: Shiny; orange testaceous (reddish in life) with a median dorsal dark stripe commencing on scutellum and tapering almost to apex on suture; antenna pitchy to blackish beyond fourth segment; mouthparts pitchy; ventral surfaces pitchy on metathorax and hind femur, slightly pitchy on tarsi, bases of tibiae and middle portions of fore and mid femora.

Head convex and barely punctured on frons and occiput; eyes nearly entire, about as widely separated as depth of one. *Antenna* two-thirds as long as body; segments thickened distally, third and fourth more slender; second three-fourths as long as third. *Prothorax*

transverse, suboblong, slightly irregular at side; disc smooth, very minutely punctured. Scutellum broad, rounded behind. *Elytra* smooth, not clearly punctured. *Last abdominal sternite* grooved medially and with a broad truncate apical process bounded on each side by an oblique emargination, into which fit sides of last tergite; aedeagus not grooved mid-dorsally, attenuated and with a downward bending apical process. First hind tarsal segment as long as following segments combined, less than one-half as long as hind tibia. Length 2.7-3.5 mm., breadth 1.4-1.6 mm.

Female: Last abdominal sternite plain, unlobed and ungrooved.

DISTRIBUTION: New Guinea, western Micronesia.

S. MARIANA IS. SAIPAN: Twelve specimens, Aug. 1951, R. M. Bohart. TINIAN: Three, Nov. 1952, Beardsley, on weeds. GUAM: Twenty-five, Yigo, Yona, and Nimitz Beach, Aug. 1952, Krauss; Agana Heights (Tutujan), Nov. 1952, Gressitt, Oct. 1953, Liming; Agana, Oct. 1952, at light, Beardsley; Tamuning, Mar. 1954, Peterson. Possibly not taken on Guam before 1952.

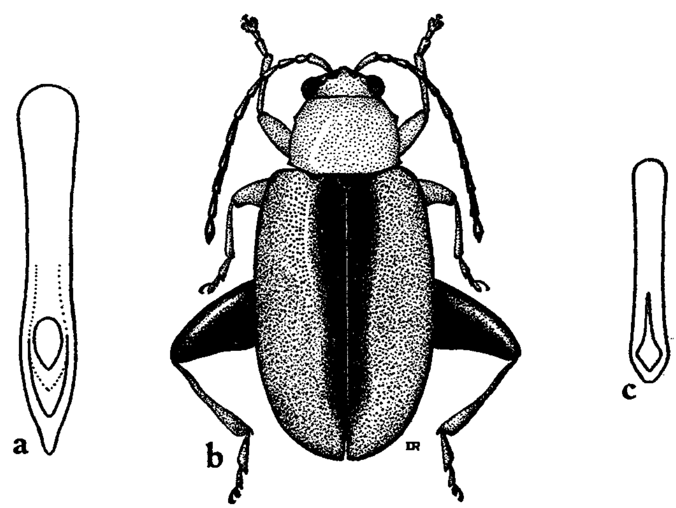


FIGURE 9.—*Aphthona* spp.: **a**, *A. bicolorata* from Saipan, dorsal view of aedeagus; **b**, *A. nanyoensis* from Saipan; **c**, dorsal view of aedeagus of *A. nanyoensis*.

PALAU. ANGAUR: Six, Feb. 1948, Dybas, Jan. 1953, Beardsley.

CAROLINE ATOLLS. ULITHI: One, Falalop I., Apr. 1953, Beardsley.

TRUK. WENA (Moen): Many, Civ. Ad. Area (Nantaku), Mar.-Apr. 1949, Potts. TONOAS (Dublon): Kuchua, Aug. 1949, Mead.

HOSTS: *Euphorbia.* Possibly also *Pithecellobium,* watermelon, and maize; but these records are indefinite, as this species has been confused with the next, which is more common on most islands.

21. **Aphthona nanyoensis** Chujo (fig. 9, *b, c*).

Aphthona sp. near *bicolorata* Jacoby, Swezey, 1942, B. P. Bishop Mus., Bull. **172**: 171 (Guam).

Aphthona nanyoensis Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3) : 302, fig. 9 (Saipan, Yap, Truk; type in Taiwan Agric. Res. Inst.).

Male: Shiny; orange testaceous to red (red in life) with a dark sutural stripe which is generally narrow and starts behind scutellum; antennae dark beyond fourth segment; sides of metathorax pitchy; abdomen sometimes pitchy; femora pitchy; tibiae and tarsi brownish.

Head finely punctured. *Antenna* three-fourths as long as body; each segment moderately thickened distally; second about as long as third. *Prothorax* short, nearly straight at each side except for beveled corners; disc smooth, very minutely punctured. Scutellum rounded-triangular. *Elytra* smooth, finely punctured. *Last abdominal sternite* with a fine median groove, and slightly emarginate apically; aedeagus grooved medially above, rounded-truncate apically. First hind tarsal segment distinctly less than one-half as long as tibia. Length 1.9-2.3 mm., breadth 0.9-1.1 mm.

Female: Last abdominal sternite plain, ungrooved and not emarginate.

DISTRIBUTION: Mariana Is., western and central Caroline Is.

N. MARIANA IS. ALAMAGAN: Sixteen specimens, July 1949, Mead.

S. MARIANA IS. SAIPAN: Many, Donni, Asgonno, Aspeldeto, Aug.-Oct. 1941, Matusita, north end, As Mahetog, Garapan, Mt. Tagpochau, Laulau Bay, Nov. 1944-Aug. 1945, Dybas and Edgar. TINIAN: Many, ridge, southeast section, central section and north of Tinian Harbor, Apr. 1945, Dybas; Marpo Valley, June 1946, on *Euphorbia,* Oakley; Lake Hagoya, June 1946, Townes, on *Pithecellobium.* GUAM: Umatac and Sumay, 1936, Swezey and Usinger; several, Pt. Amantes, and north-central Guam, May-June 1945, G. Bohart and Gressitt; Pt. Oca and Piti, May-June 1945, Dybas; Mt. Alifan, Apr. 1946, Krauss; Mt. Alutom, June 1946, Townes; Agana, Oct. 1952, Krauss.

PALAU. KOROR: Three, July 1946, Oakley; Sept. 1952, Beardsley.

YAP. Many, Kolonia, Ruul, central Yap I., Tomil, Gagil, south Map I., east Rumung, and south Rumung I., July-Aug. 1950, Goss; Yap I., Oct. 1952, Krauss; Kolonia, Mar. 1954, Beardsley.

CAROLINE ATOLLS. SOROL: Five, Sorol I., Oct. 1952, Krauss.

TRUK. WENA (Moen): Three, Oct. 1952, Beardsley.

HOSTS: *Euphorbia hirta, E. atoto, Pithecellobium dulce* (definite); perhaps also watermelon and maize, but these records may be confused with preceding species.

Since these two species breed to some extent on certain weeds, they may be easily transferred from one island to another. The original home of *A. nanyoensis* may be difficult to determine.

Genus **Altica** Müller

Altica Müller, 1764, Fauna Ins. Fridrichsdal., XIV.—Fabricius, 1775, Syst. Ent., 112.

Haltica Koch, 1903, Ent. Hefte 2 : 5 (type: *Chrysomela oleracea* L.; Europe).
—Maulik, 1926, Fauna of India, Col. Chrys. Halt., 418.

Moderately large; metallic; pronotum with a transverse groove parallel to base; hind femur not very strongly swollen.

This genus is almost cosmopolitan and ranges in the Pacific to Fiji and western Micronesia.

22. **Altica jussiaeae** Gressitt, n. sp. (fig. 10).

Haltica cyanea, Chujo, 1943 (not of Weber, 1791), Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3) : 306, fig. 11 (Palau, Yap).

Shiny dark metallic green with a slightly bronzy tinge; antenna, scutellum, ventral surfaces, and legs black with a faint bronzy tinge.

Head narrower than prothorax, ridged and rough on frons, smooth on vertex and occiput; vertex grooved medially and behind. *Antenna* three-fourths as long as body; scape subequal in length to fourth to tenth segments; eleventh longer and second and third shorter; third longer than second. *Prothorax* convex, nearly impunctate, with a

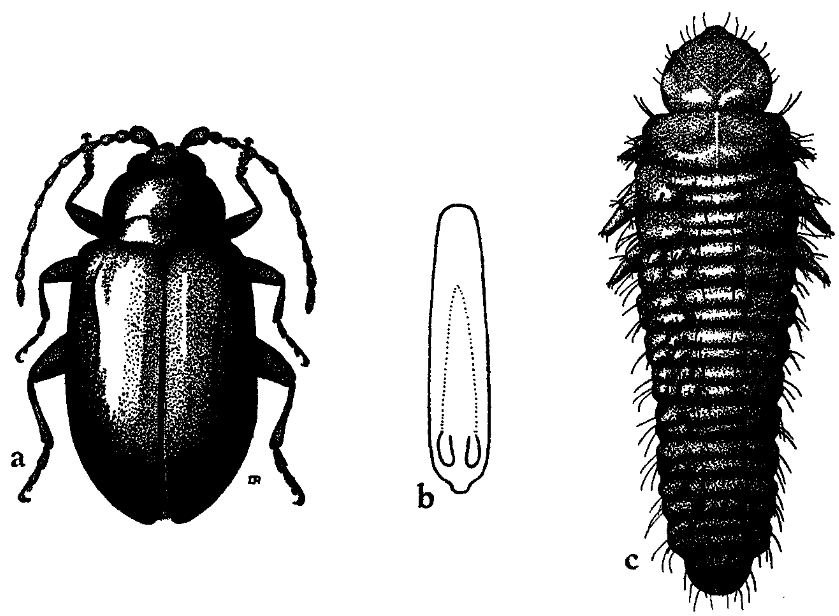


FIGURE 10.—*Altica jussiaeae:* **a**, adult male from Yap; **b**, dorsal view of aedeagus of male from Yap; **c**, dorsal view of larva from Yap.

shallow groove parallel to base. Scutellum triangular. *Elytra* subparallel-sided, tapered apically; disc of each finely and irregularly punctured, with a slight tendency toward narrow stripes without punctures. *Ventral surfaces* finely punctured. *Aedeagus* flattened and suboblong, concave along much of median line, broadening slightly from base to just before apex, which bears a short broadly rounded terminal process. Length 4.7-5.6 mm., breadth 2.3-2.6 mm.

Submature larva: Black, with less sclerotized areas also black on dorsum; a pale area on each side of head. Median epicranial suture short; frons with six long hairs. Pronotum narrowly concave and pale along median line; basal half of each side with two swellings, inner with one and outer with two bristles; anterior margin with a few bristles. Mesonotum and metanotum each with central anterior and posterior transverse swellings, each with a pair of bristles and each side with a transverse basal swelling with two bristles and an arcuate lateral swelling with three bristles. Each abdominal tergite with similar anterior and posterior central transverse swellings and each side with two anterior and two posterior sublateral swellings, each with one bristle, and lateral swelling with two bristles. Abdominal sternites each with one central swelling, and on each side an oblique subçentral swelling and two longitudinal sublateral swellings, each with two bristles.

Holotype, male (US 62567), Ulimang, Babelthuap I., Palau, Dec. 1947, Dybas; allotopotype, female (US); many paratypes (US, CM, BISHOP, BM), Ulimang, Babelthuap Dec. 1947, Dybas; Ngaremeskang and east Ngatpang, Babelthuap, Dec. 1952, Gressitt; Koror, Jan. 1948, Dybas, Mar. 1948, Maehler, July 1951, Gressitt, Sept. 1952, Krauss; on *Jussiaea,* 1952, Beardsley; Arakabesan [Ngerkabesang] I., July 1946, Townes; Garakayo [Ngergoi], Aug. 1945, Dybas; Peleliu, Aug. 1945, Hagen and Dybas.

YAP: Yap I., Oct. 1952, Krauss; Mt. "Gillifitz" [Tabiwol], Yap I., Nov. 1952, Gressitt; Yap I., Mar. 1954, Beardsley.

DISTRIBUTION: Palau, Yap.

HOST: *Jussiaea erecta.*

Differs from *A. cyanea* Weber of southern Asia in being slightly smaller, bronzy green instead of blue, and in having the frons less distinctly wrinkled anteriorly, the vertex with the pair of swellings smooth and more convex, the pronotum not punctured basally, the scutellum more blackish and impunctate, and the elytra less heavily punctured and in part more nearly seriately punctured.

This species may not necessarily be endemic to Micronesia, though it appears to be an unnamed form.

Genus **Micrepitrix** Laboissiere

Micrepitrix Laboissiere, 1933, Mus. Nat. Hist. Natur. Paris, Bull. II, **5**: 205 (type: *M. coomani* Laboissiere; Indo-China).

This genus is characterized by species of minute size with sparse long erect bristles, particularly on posterior portions of elytra, with a few at sides of prothorax. It is known only from parts of southeast Asia and from the western Carolines.

23. **Micrepitrix carolina** (Chujo), new comb. (fig. 11).

Epithrix carolina Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 304, fig. 10 (Yap; type in Taiwan Agric. Res. Inst.).

Shiny black with a purplish tinge; antenna, labrum and palpi testaceous; clypeus and mandibles reddish ochraceous; legs brown to testaceous. Dorsum sparsely clothed with

fine, erect, pale hairs, most of them on margins of prothorax and in a few rows on elytra.

Head distinctly narrower than prothorax, largely impunctate; eye small, rounded-oval. *Antenna* three-fifths as long as body, slender; basal and distal segments thicker; second segment as large as scape, much larger than third; third to sixth subequal; seventh and following larger. *Prothorax* transverse, broadened anteriorly to slightly behind anterior angles; sides somewhat irregular with bristle-insertions slightly projecting; disc with a transverse groove with a row of punctures parallel to base and anterior portion deeply punctured. *Elytra* with distinct and subregular puncture-rows, the punctures finer posteriorly. *Ventral surfaces* sparsely punctured. Length 1.2-1.55 mm., breadth 0.5-0.6 mm.

DISTRIBUTION: Western Caroline Is.

PALAU. One hundred and thirty specimens (US, CAS, BISHOP, CM, BM). BABELTHUAP: Wooded peak southwest of Ulimang, Dec. 1947, Dybas. KOROR: Limestone Ridge, southeast Koror, Jan. 1948, Dybas; Koror, Mar. 1948, Maehler; Limestone Ridge, northeast Koror, Dec. 1952, Gressitt.

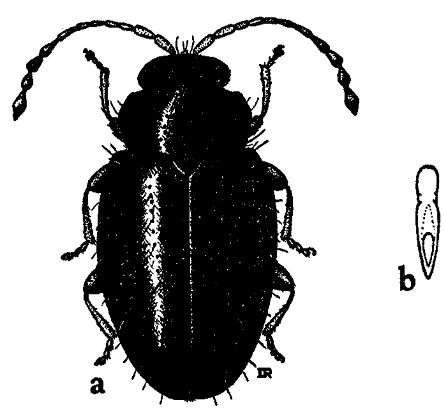


FIGURE 11.—*Micrepitrix carolina:* **a**, adult male from Babelthuap; **b**, dorsal view of aedeagus of male from Babelthuap.

NGARMALK ("Auluptagel"): Sept. 1952, Krauss. Over half of the specimens were taken in the limestone areas. PELELIU: Northeast coast, Jan. 1948, Dybas.

YAP. YAP: Six (US, BISHOP), near Yaptown, July 1946, Townes; hill behind Yaptown and Mt. Matade [Madaade], Nov.-Dec. 1952, Gressitt.

HOST: Found on leaves of native woody plants.

Genus **Sphaeroderma** Stephens

Sphaeroderma Stephens, 1831, Illustr. Brit. Ent. Mandib. **4**: 328.—Maulik, 1926, Fauna of India, Col. Chrys. Halt., 316 (type: *Altica testacea* Fabricius; Europe).

Body round, compact; mouthparts protruding; antenna stout, beadlike; hind femur elliptical; first hind tarsal segment no longer than next two combined.

This genus is almost cosmopolitan but is primarily Asian.

24. **Sphaeroderma wedeliae** Gressitt, n. sp. (fig. 12, *a-c*).

Male: Largely black or reddish; head reddish brown, paler anteriorly; labrum pale ochraceous; antenna testaceous basally, pitchy on last five segments; prothorax reddish at sides of disc, pitchy along central portion from apex to base; scutellum black; elytra pitchy black, each with an obliquely oval red area just anterior to middle and much closer to suture than external margin; ventral surfaces ochraceous on prosternum, reddish pitchy to dark pitchy on the remainder, except for paler apex of last abdominal sternite; legs pitchy black on femora except for apices, reddish on remainder.

Head short, with mouthparts produced downward; labrum long; frons ridged and pitted, slightly hairy; occiput smooth, separated from vertex by a deep subtransverse groove. *Antenna* barely more than one-half as long as body; scape moderately swollen; pedicel one-half as long, and two-thirds as thick, as scape; third to fifth segments slender, each not quite as long as second; sixth a little thicker; seventh to last much thicker;

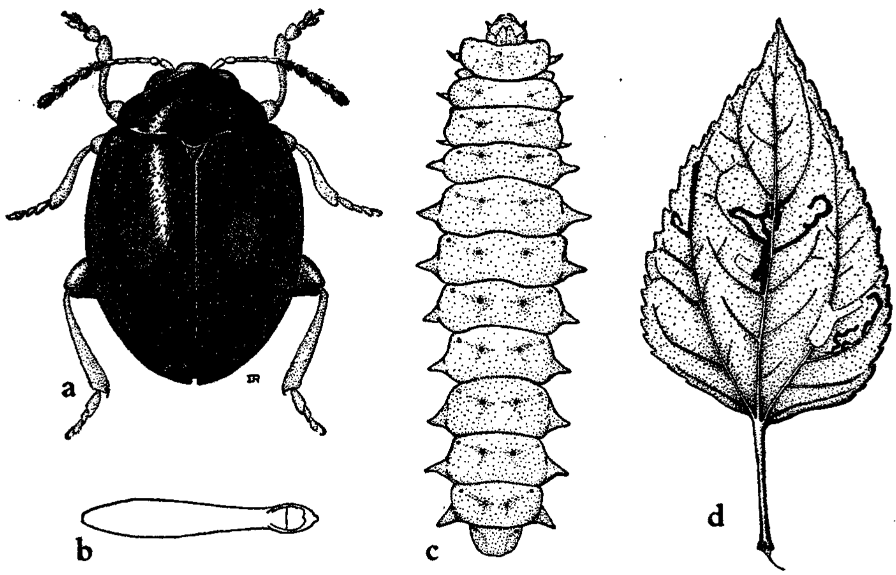


FIGURE 12.—*Sphaeroderma wedeliae:* **a,** adult male from Wena, Truk; **b,** dorsal view of aedeagus of male; **c,** dorsal view of mature larva from Kusaie; **d,** leaf of *Wedelia biflora* from Kusaie, showing mines of four larvae.

seventh to tenth as broad as long. *Prothorax* nearly twice as broad as long, smooth, finely but distinctly punctured. Scutellum minute, triangular. *Elytra* broader than prothorax, somewhat produced posteriorly; each with 11 slightly uneven rows of fine punctures, the rows becoming somewhat confused near apex; interspaces much broader than punctures, in part minutely punctulate. *Ventral surfaces* sparsely punctured, more heavily so on metasternum; last abdominal sternite with a short median rounded-truncate process with a shallow emargination on each side. Hind femur about twice as long as broad; third tarsal segment moderately broad. *Aedeagus* widest near base, tapering to an oval terminal lobe which is wider than portion preceding it and which bears a slight process at tip. Length 1.95 mm., breadth 1.35 mm.

Female: Last abdominal sternite entire. Length 2.1 mm., breadth 1.5 mm.

Paratypes: Length 1.9-2.25 mm., breadth 1.3-1.5 mm.

Mature larva: Creamy white; slightly brown on top of head and parts of pronotum. Body flattened, feebly sclerotized. Head capsule flat, deeply rounded-emarginate posteriorly; antennae prominent, three-segmented. Pronotum flat, transverse anteriorly, arcuate posteriorly. Thoracic legs prominent, hardly pigmented; each nearly as long as segment bearing it. Abdominal segments short, without swellings or bristles; first to eighth each with a tapering subacute process at each side; each process shorter than a true leg; ninth segment subtruncate. Length 4.5 mm. The mine is narrow and sinuous, often in part paralleling a leaf-vein; it is largely filled with frass and the pupal cell is broader and largely clear.

Holotype, male (US 62568), Mt. Iron, alt. 100 m., Fefan I., Truk, Jan. 31, 1953, Gressitt; allotopotype, female (US), alt. 180 m.; 185 paratypes (US, CM, BISHOP, CAS, BM) from Truk: Fefan, Jan. 31, Mt. Unibot, Ton (Tol) I., Dec. 1952, Feb. 4, 1953, Mt. Teroken [Chukumong], Moen [Wena], Dec. 1952, Feb. 1953, Gressitt; Moen [Wena], Pis I., and Tol [Ton], June 1946, Townes and Oakley; Moen, Feb. 1948, Maehler, Feb. 1949, Dybas, Jan. 1949, Langford; Dublon [Tonoas], Feb. 1948, Maehler, Oct. 1952, Beardsley; Civ. Ad. Area (Nantaku), Epinup, and south slope Mt. Tonaachau, Moen [Wena], Mar.-Apr. 1949, Potts.

CAROLINE ATOLLS. LAMOTREK: Two, Lamotrek I., Sept. 1952, Krauss, Feb. 1953, Beardsley. NOMWIN: Thirty-eight, May 1946, Oakley; Nomwin and Fananu Is., Feb. 1954, Beardsley. NAMA I.: One, Oct. 1952, Beardsley. SATAWAN: Two, Satawan I., Nov. 1952, Beardsley.

PONAPE. Thirty-seven, Napali I., June-Sept. 1950, Adams.

KUSAIE. Fifty, Mutunlik, Lele I. and foot of Mt. Fuinkol, Feb. 1953, Gressitt; Mutunlik, Lelu I., "Hill 541," and Songkosra, Mar.-Apr. 1953, Clarke.

DISTRIBUTION: Central and eastern Caroline Is.

HOST: Larva and adult feed on *Wedelia biflora*. Larva is a leafminer. (See figure 12, *d.*) Adults were also taken in light traps and under bark of a dead breadfruit tree.

Differs from *S. negrosanum* Weise in being slightly smaller and largely black or pitchy instead of brown, with the elytral punctures finer and arranged in more complete rows. According to G. E. Bryant, this new form is somewhat allied to *S. malayanum* Jacoby from Sumatra.

Genus **Schenklingia** Csiki and Heikertinger

Eucycla Baly, 1876 (not of Bonaparte, 1854), Ent. Soc. London, Trans. **1876**: 439 (type: *E. quadripustulata* Baly; Borneo).—Maulik, 1926, Fauna of India, Col. Chrys. Halt., 305.

Schenklingia Csiki and Heikertinger, 1940, Coleopt. Cat. **169**: 516.

Body round and compact; antennal scape long and sinuate, about one-half as long as remaining segments combined, fitting in a partial groove on side of frons; eye deep, wider than space between each; pronotum sinuate and medially lobed basally; elytra seriate-punctate.

This genus is known from China and Ceylon to New Guinea and southern Micronesia.

Key to Micronesian Species of Schenklingia

1. Prosternal intercoxal process emarginate laterally and posteriorly; antenna entirely pale........ 2
   Prosternal intercoxal process broadened posteriorly, transversely truncate behind; antenna with seventh and eighth segments pitchy; Truk........ **yasumatsui**
2. Posterior process of pronotum evenly rounded; scutellum feebly emarginate basally; Ponape........ **esakii**
   Posterior process of pronotum subotuse; scutellum obtusely emarginate basally; Truk........ **yoshimurai**

25. Schenklingia esakii Chujo (fig. 13).

Schenklingia esakii Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 309, fig. 12 (female: Ponape; type in Taiwan Agric. Res. Inst.).

Schenklingia ponapensis Chujo, 1943, op. cit., 313, fig. 14 (male: Ponape; type in Taiwan Agric. Res. Inst.), new syn.

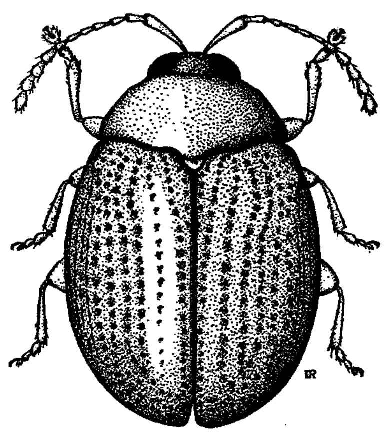


Figure 13.—*Schenklingia esakii,* male.

Male: Testaceous; distal antennal segments slightly darkened; sutural and external margins of elytra somewhat reddish.

Head smooth and shiny; eye of same convexity as rest of surfaces; frons less shiny than occiput, triangular, bordered on each side by a groove for scape, a short tooth above groove distal to middle of each side. *Antenna* fully three-fifths as long as body; scape slender, nearly one-half as long as remaining segments combined; second segment larger

than third; fifth and sixth shortest. *Prothorax* much broader than long, sinuate behind, convexly produced at middle of base; disc smooth and shiny, sparsely and very minutely punctured. Scutellum small, triangular. *Elytra* broadly rounded behind, each with 11 rows of small punctures, including sutural and marginal rows. Prosternum broad, emarginate behind. *Last abdominal* sternite slightly produced at middle and emarginate at each side. Length 2.0-2.6 mm., breadth 1.3-1.9 mm.

Female: Entirely testaceous. Last abdominal sternite entire, apical margin slightly raised in middle. Length 2.5-3.0 mm., breadth 1.7-1.95 mm.

DISTRIBUTION: Eastern Caroline Is.

PONAPE: Fifty-six specimens (US, CM, MCZ, BISHOP, CAS, BM), near Colonia, Aug. 1946, Townes; Matalanim [Madolenihm], Aug. 1946, Oakley; Mt. Nanalaud, up to 450 m., Mar. 1948, Dybas; Mt. Tolotom [Dolotomw] 600 m., Mt. Beirut [Pairot], 650 m., Tolenot Pk. (Dolen Net) 200 m., Airfield No. 2 (Palikir), June-Sept. 1950, Adams; south of Nanpohnmal and Mt. Temwetemwensekir, 180 m., Jan. 1953, Clarke and Gressitt.

Chujo in naming two species had only three specimens representing the extremes of size of the two sexes. In males the coloration varies from pure testaceous to reddish or transparent with broad sutural and marginal pitchy stripes.

26. **Schenklingia yasumatsui** Chujo.

Schenklingia yasumatsui Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 311, fig. 13 (Truk; type in Taiwan Agric. Res. Inst.).

Male: Yellowish brown to reddish brown, shiny; antenna with six basal segments pale, seventh duller, eighth blackish brown, ninth to eleventh pale with end of last duller; pronotum bordered with pitchy; elytra with parts of base and sides pitchy; median portions of sternites (except last abdominal sternite) pitchy.

Head shiny; frons briefly grooved postmedially, deeply grooved on each side for reception of scape. *Antenna* more than one-half as long as body; scape as long as following four or five segments; sixth shortest. *Prothorax* more than twice as broad as long; sinuate basally and produced at middle of base; disc finely and closely punctured. *Elytra* broadly rounded; each with 11 distinct rows of punctures. Prosternal process broad, truncate posteriorly. *Last abdominal segment* with a truncate median lobe bounded on each side by an incision. Length 3.0 mm. (After Chujo.)

DISTRIBUTION: Eastern Caroline Is.

TRUK. This species is not represented by new material. The type is from between Sabote and Epin on Pata I. [or northwest peninsula of Ton].

27. **Schenklingia yoshimurai** Chujo.

Schenklingia yoshimurai Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 315, fig. 15 (male; Truk; type in Taiwan Agric. Res. Inst.).

Female: Reddish testaceous, slightly paler on tibiae, tarsi, and distal antennal segments; eye black. Ventral surfaces, legs, and antenna in part clothed with short pale hairs.

Head smooth and shiny, somewhat duller on frons which is minutely roughened and deeply grooved along each side; eye slightly more convex than rest of upper portion of

head. *Antenna* not quite three-fifths as long as body; scape slender, as long as next five segments combined; sixth shortest; last five thickened. *Prothorax* more than twice as broad as long, sinuate basally, subobtuse at middle; disc smooth, shiny, not distinctly punctured. Scutellum emarginate basally, slightly convex at sides. *Elytra* broadly rounded; each with 11 rows of punctures, the punctures becoming minute posteriorly. Prosternal process broad, emarginate at sides, feebly so behind. *Last abdominal sternite* entire, raised at middle of posterior margin. Length 2.4 mm., breadth 1.6 mm.

Allotype, female (US), Moen [Wena] I., Truk, Oct. 1952, J. W. Beardsley.

Described originally from two males from Sabote-Epin, Pata [northwest Ton], Truk. The male cotypes are 2.5 mm. long and have the last abdominal sternite with a median truncate lobe bordered on each side by an incision. (After Chujo.)

DISTRIBUTION: Eastern Caroline Is. (Truk).

Genus **Argopistes** Motschulsky

Argopistes Motschulsky, 1860, IN Schrenck, Reisen Amurland **2**: 236 (type: *A. biplagiatus* Motschulsky; northeast Asia).—Maulik, 1926, Fauna of India, Col. Chrys. Halt., 296.

Body round, evenly convex, resembling a coccinellid; head directed posterioventrally, partially hidden from above; scape fully as long as next two segments combined, provided with a partial groove for reception on side of head; pronotum emarginate apically, sinuate basally; hind femur very broad, triangular.

This genus is almost cosmopolitan and in the Pacific occurs from Japan to New Guinea.

28. **Argopistes biplagiatus** Motschulsky.

Argopistes biplagiatus Motschulsky, 1860, IN Schrenck, Reisen Amurland **2**: 236, pl. 11, fig. 25 [Amur: type in Moscow (?)].—Chen, 1933, Sinensia **3** (9): 224, fig. 9; 1934, op, cit. **5** (3, 4): 315.—Chujo, 1936, Nat. Hist. Soc. Formosa, Trans. **26**: 110.

Male: Shiny black with a large common round red spot covering much of discal portion of elytra, except for a narrow line along basal portion of suture; antenna testaceous, slightly duller distally; ventral surfaces and legs pitchy, in part dull reddish brown.

Head ensconced in prothorax, rounded-triangular; frons somewhat flat, slightly rough, with a short narrow median groove; vertex carinate medially, slightly depressed behind; occiput smooth except for some small pits in a depression at narrowest point, which is about one-third as wide as an eye. *Antenna* two-thirds as long as body, fairly slender, slightly thickened in distal half; scape longer than any of following segments; second nearly as long as third, which is distinctly shorter than fourth; fourth and following subequal, but last longer than ninth or tenth. *Prothorax* more than twice as broad as long, deeply emarginate anteriorly, evenly convex with elytra; posterior margin feebly sinuate; disc finely punctured with a narrow median impunctate line on posterior half. *Elytra* subevenly rounded; each smooth, with humerus feebly swollen, finely and irregularly punctured, with 10 indistinct subregular rows of similar punctures, the last two rows slightly more distinct and more regular, and closer together. *Hind femur* triangular, outer angle

more acute than basal angle, two-thirds as broad as long, fairly smooth; hind tibia with a fairly acute terminal process; third tarsal segment broad. Length 2.85-3.3 mm., breadth 2.15-2.65 mm.

Female: Dorsum entirely pale castaneous red; antenna entirely testaceous; ventral surfaces red with fore and middle legs nearly testaceous. Length 3.0-3.55 mm., breadth 2.5-2.8 mm.

DISTRIBUTION: Eastern Siberia, China, Indo-China, Japan, Ryukyu Is., Formosa, Bonin Is.

BONIN IS. CHICHI JIMA: Sixteen (US, BISHOP, CAS), Tsurihama and Omura, Chichi Jima, and north end of Ani Jima, June and July, 1949, Mead.

HOST: One specimen is labeled as collected on pine. This may be questioned, as in Japan this species feeds on various broad-leaved trees.

Genus **Psylliodes** Latreille

Psylliodes Latreille, 1825, Fam. Nat. Règne Anim., 405; *apud* Berthold, 1827, Natürl. Fam. des Thierreichs, 401; 1829, IN Cuvier, Règne Anim., ed. 2, **5**: 154.—Maulik, 1926, Fauna of India, Col. Chrys. Halt., 124 (type: *Chrysomela chrysocephala* Linnaeus; Europe).

Body elliptical; antenna of 10 segments; elytra seriately punctured; hind femur large, subovate; hind tibia produced well beyond insertion of tarsus.

This genus is almost cosmopolitan, but it is primarily Palearctic and Indo-Australian.

29. **Psylliodes cucurbitae** Gressitt, n. sp. (fig. 14).

Male: Shiny green with a bronzy tinge; antenna pitchy with first four segments testaceous; clypeus testaceous; labrum pitchy; mandibles reddish; ventral surfaces and legs pitchy reddish, slightly metallic.

Head with frons ridged and rugulose; occiput smooth, sparsely and minutely punctured, with a deep pore at anterior end; eye ovate. *Antenna* just over one-half as long as body; scape hardly longer than second segment; second barely longer than third; fourth to tenth subequal, larger; last longest. *Prothorax* subfinely, distinctly, and subregularly punctured. *Elytra* broadest just behind humeri, narrowed posteriorly; each with 11 regular rows of small punctures, the first reaching end of basal third, with the punctures closer than in other rows; intervals feebly convex and minutely punctulate. *Ventral surfaces* largely shiny, sparsely punctured and sparsely hairy. Last abdominal sternite with a convex median lobe and a moderate emargination on each side. *Hind femur* about as large in area as pronotum, shiny, with a few weak wrinkles near outer swelling; hind tibia with an apical tooth and short spine, and with distal process about one-third as long as portion before tarsal insertion; first hind tarsal segment one-half as long as tibia; entire tarsus nearly as long as entire tibia. *Aedeagus* fusiform, more suddenly narrowed just before apex and with a broad suboblong lobe apically. Length 2.95 mm., breadth 1.3 mm.

Female: Last abdominal sternite entire, slightly raised in middle. Length 3.1 mm., breadth 1.4 mm.

Paratypes: Length 2.3-3.6 mm., breadth 1.2-1.6 mm.

Holotype, male (US 62569), Chichi Jima, Bonin Islands, July 10, 1951, R. M. Bohart; allotopotype, female (US), same data; 41 paratypes (US,

BISHOP, CAS, BM), Chichi Jima, R. M. Bohart; Tsurihama, Chichi Jima, June 23, 1949, Mead; June-July 1949, D. B. Langford. One specimen, Iwo Jima, Volcano Is., Jan. 1946, R. E. Bertram.

DISTRIBUTION: Bonin Is., Volcano Is.

HOSTS: Collected on pumpkin and certain weeds (Langford).

Differs from *P. balyi* Jacoby in having the pronotum and elytra more finely punctured, the pronotum smoother and the elytra less attenuated posteriorly,

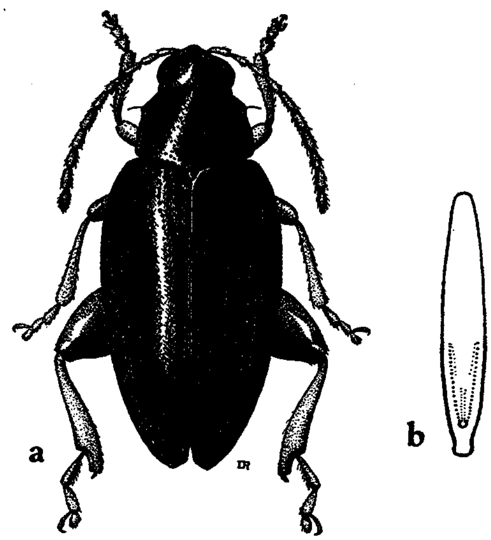


FIGURE 14.—*Psylliodes cucurbitae:* **a,** holotype, male; **b,** dorsal view of aedeagus.

the vertex longitudinally wrinkled, and the legs dark, with the hind femur green instead of pale.

Genus **Nonarthra** Baly

Nonarthra Baly, 1862, Jour. Ent. **1**: 455 (type: *N. variabilis* Baly; north India).—Maulik, 1926, Fauna of India, Col. Chrys. Halt., 114.

Body flattened and nearly round in outline; distinguished from all other genera of halticids in this part of world in having only nine antennal segments.

This genus is distributed from India and Japan to Queensland. The following record from the Bonins of a Japanese species is probably the first from an oceanic island.

30. Nonarthra cyanea Baly.

Nonarthra cyaneum Baly, 1874, Ent. Soc. London, Trans. **1874**: 210 (Nagasaki, type in British Mus.).—Chen, 1934, Sinensia **5** (3-4): 239. —Chujo, 1935, Nat. Hist. Soc. Formosa, Trans. **25**: 358.

Ennemera cyanea, Gemminger and Harold, 1876, Catalogus Coleopt. **12**: 3554.

Argopistes cyaneum, Matsumura, 1931, 6,000 Illustr. Ins. Japan, 225, fig. 617.

Female: Shiny greenish blue, tending toward reddish pitchy on posterior portions of elytra; scutellum black; ventral surfaces pitchy with last four abdominal segments testaceous; legs reddish pitchy.

Head smooth, minutely punctured; transversely depressed between eyes. *Antenna* of nine segments; fourth to last greatly broadened and flattened. *Prothorax* more than twice as broad as long, strongly convex in outline of basal margin, much longer at middle than at sides, tapering anteriorly; disc evenly convex and minutely punctured. Scutellum triangular. *Elytra* broadly rounded; disc of each finely punctured, moderately so on part of basal portion. *Ventral surfaces* finely and irregularly punctured. Last abdominal segment entire, obtusely rounded. Hind femur twice as long as broad, finely punctured. Length 3.85 mm., breadth 2.9 mm.

DISTRIBUTION: Japan, China, Indo-China, Bonin Is.

BONIN IS. CHICHI JIMA: One (Nat. Inst. Agric. Sci., Tokyo), Chichi Jima, Feb. 1922 (?), Motoike and Ise.

HOSTS: *Citrus, Pyrus, Rosa, Raphanus* (in Japan).

CRYPTOSTOMES

Head with vertex projecting strongly forward and mouth directed posteriorly below; latter often partly hidden by prosternum; body generally with expanded margins or spines, or elongate or flattened.

SUBFAMILY HISPINAE

Body spiny, or if smooth generally elongate or oval and flattened. Larvae mine in leaves or feed in newly opening portions of plants, particularly monocotyledons.

TRIBE CRYPTONYCHINI

KEY TO MICRONESIAN GENERA OF HISPINAE

1. Body more than four times as long as broad, more than twice as wide as deep; cephalic process about as long as scape in male; elytra feebly ribbed; normally in coconut.......... **Brontispa**

   Body less than four times as long as broad, less than twice as wide as deep; cephalic process much shorter than scape in male; elytra each with four strong ribs; normally in Pandanaceae.......... **Oxycephala**

Genus **Brontispa** Sharp

Brontispa Sharp, 1904, Linn. Soc. New South Wales, Proc. **28** (4): 924 (type: *B. froggatti* Sharp = *longissima* Gestro; New Britain).—Maulik, 1938, Zool. Soc. London, Proc. **108** (B): 49-71.

Bronthispa, Weise, 1911, Coleopt. Cat. **35**: 46.
Planispa Chujo, 1937, Nat. Hist. Soc. Formosa, Trans. **27**: 223 (type: *P. castaneipennis* = *B. mariana*).

Body extremely flattened and elongate; dorsum rather smooth except for punctures; head with an anteriorly projecting process between antennae; prothorax slightly expanded near apex.

This genus is primarily Papuan, Philippine, and Micronesian, with a species each in Mauritius and Rodriguez. Several of the species are coconut pests of great importance. Both larvae and adults feed between the new leaflets just as they begin to emerge and open. The most important species in Micronesia is the Mariana coconut beetle, *B. mariana.*

KEY TO MICRONESIAN SPECIES OF BRONTISPA

1. Dorsum bluish or greenish; elytral apex slightly emarginate-truncate and with two or three ribs near apex........ 2
   Dorsum brown; elytral apex subobliquely truncate, without any distinct ribs near apex; cephalic process of male longer than scape, about three times as long as broad, rectangular; in female trapeziform, nearly as broad as long, very deeply grooved........ **mariana**
2. Elytra deep metallic blue, rarely with a greenish or bronzy tinge, slightly brownish at extreme apices; cephalic process of male as long as scape, four times as long as breadth at middle, slightly tapering and rounded apically; in female much longer than broad, tapering strongly, subacute apically, narrowly and deeply grooved........ **palauensis**
   Elytra bronzy green with a slight bluish tinge, distinctly brown apically; cephalic process of male not quite as long as scape, less than twice as long as broad, somewhat narrowed in basal portion, subtruncate apically; in female broad, strongly narrowed and subrounded apically, shallowly grooved........ **chalybeipennis**

31. Brontispa mariana Spaeth (fig. 15, *b, e, h*).

Brontispa mariana Spaeth, 1937, Roy. Ent. Soc. London, Proc. B, **6**: 26 (Saipan; *Bronthispa;* type in British Mus.).—Maulik, 1938, Zool. Soc. London, Proc. **108** (B): 69, 70, fig. 18 g (female).—Doutt, 1950, Hawaiian Ent. Soc., Proc. **14** (1): 55-58 (paras.).—Lange, 1950, Hawaiian Ent. Soc., Proc. **14** (1): 143-162 (biol.).—Uhmann, 1952, Münchner Ent. Gesell., Mitt. **42**: 72.—Pemberton, 1953, Seventh Pacific Sci. Congr., New Zealand, Proc. **4**: 95.—Oakley, 1953, Seventh Pacific Sci. Congr., New Zealand, Proc. **4**: 180.—Lange, 1953, Seventh Pacific Sci. Congr., New Zealand, Proc. **4**: 249-255.—Gressitt, 1954, Hawaiian Ent. Soc., Proc. **15** (2): 268; 1954, Insects of Micronesia **1**: 175.

Planispa castaneipennis Chujo, 1937, Nat. Hist. Soc. Formosa, Trans. **27**: 225, figs. 1-4, 8.—Esaki, 1940, Bot. Zool. Tokyo **8** (1): 276; 1941, Sixth Pacific Sci. Congr., Berkeley, Proc. **4**: 409.—Uhmann, 1952, Münchner Ent. Gesell., Mitt. **42**: 73.

Planispa mariana, Yasumatsu, 1941, Kyushu Imp. Univ., Alumni Bull. Fac. Agric. **6**: 21, fig. 7.—Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 320, fig. 17.—Esaki, 1943, Bot. Zool. Tokyo **11** (3, 4): 272, 357, figs. 1-7; 1952, Ninth Int. Congr. Ent., Amsterdam, Trans. **1**: 815.

Brontispa castaneipennis, Lepesme, 1947, Les insectes des palmiers, 545.

Male: Reddish brown, darker on head and pronotum, paler beneath.

Head moderately punctured, somewhat deeply grooved; cephalic process parallel-sided, longer than scape, rounded-truncate apically. *Antenna* one-third as long as body. *Prothorax* smooth, with only about 30 large punctures on each side of disc; anterior angles somewhat rounded. *Elytra* rounded-truncate apically; discal punctures mostly more than one-half as wide as longitudinal interspaces; about 30 punctures in first complete row. *Last abdominal sternite* arcuately emarginate, feebly punctured. Length 7-8.6 mm., breadth 1.6-2 mm.

Female: Cephalic process trapeziform, very deeply grooved at base. Last abdominal sternite shallowly emarginate, finely and sparsely punctured.

Mature larva: Testaceous. Body strongly flattened. Head about twice as broad as long, very finely reticulate; frons with a narrow depressed triangle which tapers very narrowly to forking of epicranial suture; anterior margin of head with about 10 fine, erect hairs on each side, mostly barely longer than antenna. Prothorax transversely oblong, rounded at posterior angles; mesothorax and metathorax without lateral processes. Each abdominal segment with a moderately stout tapering lateral process which bears four or five short hairs on sides. Last (eighth) abdominal segment bearing tail-shovel with slightly diverging arms; each arm stout, smooth internally, with widely spaced small tubercles externally, and with apex suddenly tapering and bent inward. Length 9 mm.

DISTRIBUTION: Southern Marianas Is., except Guam; west-central to east-central Carolines.

S. MARIANA IS. SAIPAN: Garapan, etc., 1940-1941, Matusita; many localities, Dybas, Langford, Lange, Doutt, Krauss, Townes, Oakley, and others, 1945-1949. TINIAN: Observed by Langford, Owen, and others. ROTA: As Malete, June 1946, Townes.

YAP. YAP: July 1946, Oakley; Kolonia and S. Yap I., 1950, Goss; Mar. 1954, Beardsley. GAGIL-TOMIL: Gagil, Nov. 1948, Langford.

CAROLINE ATOLLS. ULITHI: Fassarai I., Mogmog I., July 1946, Oakley; May 1948, Langford; Falalop I., Apr. 1952, Beardsley. WOLEAI: Utagal I., July 1946, Oakley; Feb. 1953, Beardsley. NOMWIN (Hall Is.): Nomwin I., May 1946, Oakley; Nomwin I., Fananu I., Feb. 1954, Beardsley. EAST FAYU I.: Oct. 1952, Beardsley. LOSAP: Pis I., 1953, Beardsley. NUKUORO: Shenukdei I., Aug. 1946, Oakley.

TRUK. Wena, Tonoas, Fefan, Utet, Ton, 1946-1953, Oakley, Gressitt, and others.

HOST: *Cocos nucifera* (coconut).

Esaki states that this species occurs on most of the atolls between Yap and Truk. Nukuoro is the easternmost record. Beardsley recently searched for the species in the Mortlock Islands without finding it. I question a Ponape record,

even though there are specimens so labeled in Bishop Museum (1946). However, it may be that the species has been introduced there. Yap may be the original native home of this species. As it is related structurally to *B. palauensis,* it may have been derived from that species, or had a common ancestor. This species, though widely spread, is rarely a serious pest in the Carolines. This suggests that it must possess some natural controls in its native home which were not taken with it to the Marianas, where it has caused such great destruction to coconut palms. It was first reported from Saipan in 1931, according to Esaki. It may have been newly introduced to East Fayu when damage was reported there in 1952. The larval-pupal parasite, *Tetrastichus brontispae* (Ferrière), was introduced to the Marianas by Lange in 1948, and is established. The egg parasite, *Haeckeliana brontispae* Ferrière, did not become established.

32. Brontispa palauensis (Esaki and Chujo). (Figure 15, *a, d, g.*)

Planispa chalybeipennis, Chujo (not of Zacher), 1937, Nat. Hist. Soc. Formosa, Trans. **27**: 227, figs. 5-7, 9 (Palau).

Planispa palauensis Esaki and Chujo [Esaki, 1940, Bot. Zool. Tokyo **8** (1): 276, *nom. nud.*]; Esaki, 1943, Bot. Zool. Tokyo **11** (3): 272, figs. 1, 2; **11** (4): 361.—Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 322 (Palau; type in Taiwan Agric. Res. Inst.).

Brontispa chalybeipennis, Lepesme (not of Zacher), 1947, Les insectes des palmiers, 545.—Oakley, 1953, Seventh Pacific Sci. Congr., New Zealand, Proc. **4**: 180 (part: Palau).

Brontispa yoshinoi Barber, 1950, Washington Acad. Sci., Jour. **40** (8): 245.—Hagen and Doutt, 1950, Ent. Soc. Am., Ann. **43** (3): 311-319, 17 figs.

Brontispa palauensis, Uhmann, 1951, Ann. Mag. Nat. Hist. XII, **4**: 187.—Gressitt, 1953, B. P. Bishop Mus., Bull. **212**: 93, 94, 103; 1954, Hawaiian Ent. Soc., Proc. **15** (2): 268; 1954, Insects of Micronesia **1**: 176, fig. 67, *b* (damage).

Male: Steel blue with a purplish, and rarely a bronzy or greenish, tinge; antenna and parts of head and sides of prothorax sometimes purplish or pitchy red; ventral surfaces and legs reddish brown.

Head strongly punctured, deeply grooved; cephalic process as long as scape, very slender and nearly parallel-sided, rounded apically. *Prothorax* heavily punctured, with about 50 large punctures on each side of disc, and also with fine punctures; anterior angles obtusely rounded. *Elytra* each rounded ectoapically and briefly truncate, and barely emarginate, near sutural angle; discal punctures large throughout, in part nearly as wide as longitudinal interspaces; about 40 punctures in first complete row. *Last abdominal sternite* shallowly emarginate, distinctly punctured. Length 6.8-9.5 mm., breadth 1.3-2.0 mm.

Female: Cephalic process narrow, strongly tapering, narrowly truncate apically, narrowly grooved. Last abdominal sternite feebly emarginate, finely punctured.

Mature larva: Head minutely granulose; frons with a slightly depressed triangle. Mesothorax and metathorax without lateral processes. Last (eighth) abdominal segment

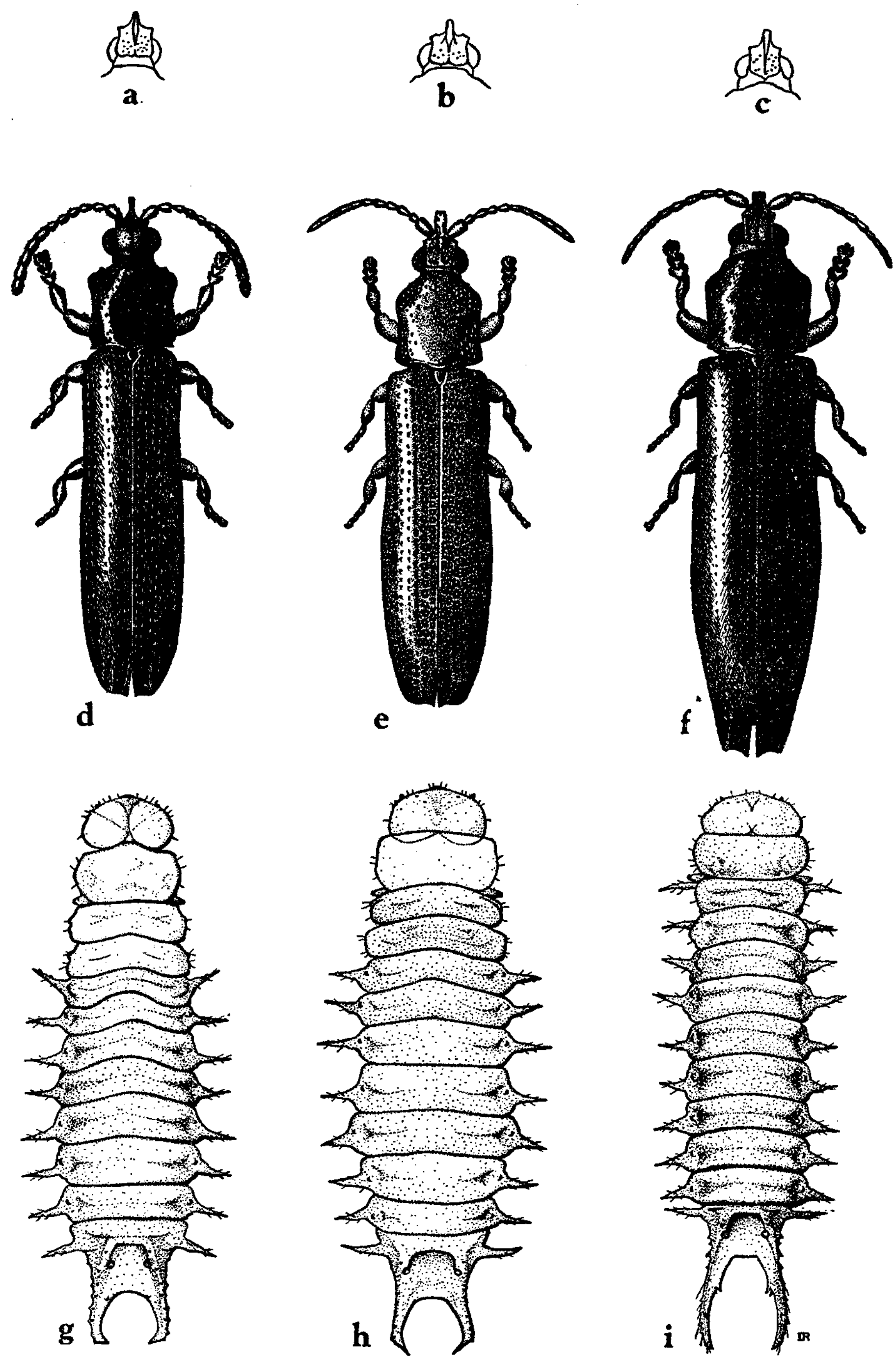


FIGURE 15.—**a, d, g,** *Brontispa palauensis: a,* dorsal outline of head of female; *d,* adult male from Babelthuap; *g,* dorsal view of mature larva. **b, e, h,** *B. mariana: b,* dorsal outline of head of female; *e,* male from Ton I., Truk; *h,* dorsal view of mature larva. **c, f, i,** *B. chalybeipennis: c,* dorsal outline of head of female; *f,* male from Jaluit Atoll; *i,* dorsal view of submature larva from Likiep Atoll.

bearing tail-shovel with stout, obliquely diverging, and then slightly incurving, arms which narrow suddenly and curve strongly inward at apices. Inner borders of arms spineless and outer borders with two rows of tubercles. Length 10 mm.

DISTRIBUTION: Western Caroline Is.

PALAU. BABELTHUAP: Southern part, 1946, Oakley, 1948, Doutt; Ngiwal, 1951, Gressitt. KOROR: 1946, Oakley; 1948, Doutt; 1953, Beardsley. NGERKABESANG (Arakabesan): 1948, Doutt. PELELIU: 1946, Oakley; 1948, Doutt; 1949, Langford, "in young *Pandanus*."

HOST: *Cocos nucifera;* rarely in *Pandanus.*

This species is not conspicuous and rarely seems to cause serious damage. Since the introduction of *Oryctes rhinoceros* to Palau this *Brontispa* has apparently hastened the destruction of palms severely damaged by *Oryctes* (Gressitt, 1953, B. P. Bishop Mus., Bull. 212). Apparently this species has not yet been noted on Ngaiangl or Angaur. Presumably it must have fed upon some of the native palms before the introduction of the coconut palm. Langford's is the only record for *Pandanus.*

33. Brontispa chalybeipennis (Zacher). (Figure 15, *c, f, i.*)

Oxycephala (*Xiphispa* ?) *chalybeipennis* Zacher, 1913, K. Biol. Anst. Land-u. Forstwirts., Berlin, Arb. **9**: 101 (Ponape).

Bronthispa (?) *chalybeipennis,* Zacher, 1915, Zeitschr. Angew. Ent. **2**: 423, 3 figs. (Ponape; type in Deutsche Ent. Inst., Berlin).

Bronthispa chalybeipennis, Spaeth, 1936, Temminckia **1**: 287.

Planispa chalybeipennis, Chujo, 1937, Nat. Hist. Soc. Formosa, Trans. **27**: 227, fig. (part).—Esaki, 1941, Sixth Pacific Sci. Congr., Berkeley, Proc. **4**: 409; 1943, Bot. Zool. Tokyo **11** (3, 4): 272, 360, figs. 1, 8; 1952, Ninth Int. Congr. Ent., Amsterdam, Trans. **1**: 815.

Brontispa chalybeipennis, Maulik, 1938, Zool. Soc. London, Proc. **108** (B): 70, fig. 18 i.— Lepesme, 1947, Les insectes des palmiers, 545.—Uhmann, 1951, Ann. Mag. Nat. Hist. XII, **4**: 185, fig. 1.—Hardy (and Barber), 1950, Hawaiian Ent. Soc., Proc. **14** (2): 208.—Oakley, 1953, Seventh Pacific Sci. Congr., New Zealand, Proc. **4**: 180.—Gressitt, 1954, Insects of Micronesia **1**: 177.

Brontispa namorikia Maulik, 1947, Ann. Mag. Nat. Hist. XI, **13**: 498, 3 figs.

Male: Elytra bronzy green, sometimes tinged with bluish, reddish, or purplish; elytral apices and external margins posteriorly reddish brown; head and pronotum purplish or pitchy to black; antennae and ventral surfaces of head and thorax pitchy reddish; abdomen and legs ochraceous.

Head unevenly punctured, narrowly grooved on occiput and broadly grooved on process; cephalic process broad, not quite as long as scape, tapered to middle, broadly truncate apically. *Prothorax* with anterior corners obliquely truncate; disc sloping at sides, with about 45 large punctures on each side, as well as minute punctures. *Elytral apex* with outer angle pronounced and apical margin emarginate; discal punctures in part

less than one-half as wide as longitudinal interspaces, which are finely wrinkled; about 40 punctures in first complete row. *Last abdominal sternite* arcuately emarginate, not distinctly punctured. Length 7-8.5 mm., breadth 1.5-2.0 mm.

Female: Cephalic process broad, tapering, rounded-truncate apically, broadly grooved. Last abdominal sternite broadly truncate, shallowly emarginate, minutely and sparsely punctured.

Mature larva: Head apparently finely punctured; frons with a depressed triangle edged at sides with short oblique ridges. Mesothorax and metathorax with lateral processes similar to those of abdominal segments. Sixth and seventh abdominal segments shorter than preceding segments. Last (eighth) abdominal segment bearing tail-shovel with very long, gradually tapering arms which curve inward at apices and bear a pair of teeth on inner side of each at one-third distance from base (on inner side) to apex. Outer edge of each arm with about nine widely spaced tubercles or spines, the basal ones longer. Length 9 mm.

DISTRIBUTION: Eastern Caroline Is., Marshall Is.

PONAPE. Agric. Exper. Sta., June 1940, Matusita; Metalanim [Madolenihm], 1946, Oakley, 1949, Ross, 1950, Adams; Colonia, 1948, Dybas, 1953, Beardsley; Summit of Mt. Tamatamansakir [Temwetemwensekir], 1948, Dybas; Mt. Tolenkiup [Dolen Kiepw], 300 m., 1950, Adams; Likop, Nanpohnmal, 1953, Gressitt.

KUSAIE. Lele, 1946, Oakley; Mutunlik, 1953, Clarke.

MARSHALL IS. NAMORIK: Namorik I., 1945, Wallace (from same series as types of *B. namorikia*). EBON: Reported by Dwight Heine, 1952. KILI I.: Reported to Hatheway, 1952. JALUIT: Imroj I., 1946, Oakley. AILINGLAPALAP: Bigatyelang I., 1946, Oakley, 1949, Langford. NAMU: Namu I., Oct. 1953, Beardsley. KWAJALEIN: Enmat (Enmet) I., 1948, Maehler. LIKIEP: 1950, Langford. MAJURO: Dalap I., 1946, Oakley; Darit I., 1949, Owen. ARNO: Reported by Hatheway, 1952. MILI: Ngalu I., 1952, Hatheway.

HOST: *Cocos nucifera;* also probably *Exorrhiza ponapensis.*

Esaki reported this species from the following atolls in the Marshalls: Arno, Majuro, Aur, Maloelap, Wotje, Ailuk, Mejit, Utirik, Jaluit, Ebon, Ailinglapalap, Namu, and Kwajalein. Thus it is known on practically all the Marshalls except the northernmost. Since I found this species among *Exorrhiza* and *Ponapea* palms near Nanpohmal on Ponape, and since Dybas took it on the summit of Temwetemwensekir, where *Exorrhiza* is predominant and coconut palms are lacking, it very likely fed in this palm originally, and may have evolved from its ancestor from the south, on Ponape or Kusaie. Why it spread so far eastward and not westward is a puzzle.

Genus **Oxycephala** Guérin-Méneville

Oxycephala Guérin-Méneville, 1830, Voy. Coquille, Zool. 2: 142 (type: *O. cornigera* Guérin-Méneville; Solomon Is.).—Chapuis, 1875, Gen. Col. **11**: 288.

Plesispella Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 325 (type: *P. spaethi* Chujo; Palau).

Body long and broad, somewhat flattened, widest behind middle of elytra; head with a short, laterally compressed anterior process; prothorax narrowed apically, subparallel basally; elytra with alternate interspaces forming more or less distinct ridges. Secondary sexual dimorphism appears limited to a stronger lobing of the ectoapical angles of the elytra in the female.

This genus is known only from Melanesia, Australia, the Moluccas, and Micronesia. The Micronesian species were not correctly placed by Chujo. Some members of this genus attack the coconut palm, at least occasionally.

Key to Micronesian Species of Oxycephala

1. Pronotum rather evenly convex, closely, finely, and regularly punctured on sides of disc, and without irregular raised impunctate areas; scutellum generally more than one-half again as long as broad; dorsum metallic blue-green or extensively marked with orange testaceous, particularly on central portion of pronotum; length 8.5-11 mm. 2
   Pronotum unevenly convex, with irregular raised impunctate areas on sides of disc; scutellum less than one-half again as long as broad; dorsum black or pitchy black, sometimes striped with dark castaneous and paler at extreme base; length, 11-14 mm. .... **pandani**
2. Dorsum pitchy with a broad testaceous stripe from anterior margin of pronotum to top of posterior declivity of elytra, often slightly interrupted on middle of elytra; interantennal process grooved medially; spine at basal angle of prothorax rarely projecting beyond lateral margin of thorax; frons moderately convex, not strongly rugose .... **spaethi**
   Dorsum metallic green, rarely purplish or bluish black; blacker on pronotum, reddish at extreme apices of elytra; interantennal process extremely thin on dorsal edge; spine at basal angle of prothorax generally projecting beyond lateral margin of thorax; frons very convex .... **esakii**

34. Oxycephala esakii (Chujo), new comb. (figs. 16, *a;* 17, *b*).

Plesispa (*Plesispella*) *esakii* Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. 24 (3): 330, fig. 20 (Babelthuap; type in Taiwan Agric. Res. Inst.).

Male: Elytra dark metallic green to greenish black, rarely tinged with purplish or bluish, reddish brown at extreme apices; antenna, head, and prothorax black, faintly tinged with blue or green; ventral surfaces pitchy black, with basal margins of abdominal segments ochraceous; femora ochraceous; tibiae and tarsi pitchy.

Head finely grooved and subrugose-punctate on occiput; cephalic process one-third as long as scape, strongly compressed laterally; frons strongly convex, somewhat transversely corrugated. *Antenna* one-third as long as body, cylindrical, third segment longer than fourth. *Prothorax* narrowed apically, with even margins and basal tooth projecting beyond lateral margin; disc smooth, closely and regularly punctured except for a largely impunctate median strip. Scutellum flat, microreticulate. *Elytra* with punctures much narrower than longitudinal interspaces; alternate interspaces raised, more distinctly so posteriorly; apex rounded and slightly sinuate. *Aedeagus* with terminal half parallel-sided, convex at center. Length 8.5-10.2 mm., breadth 3-3.2 mm.

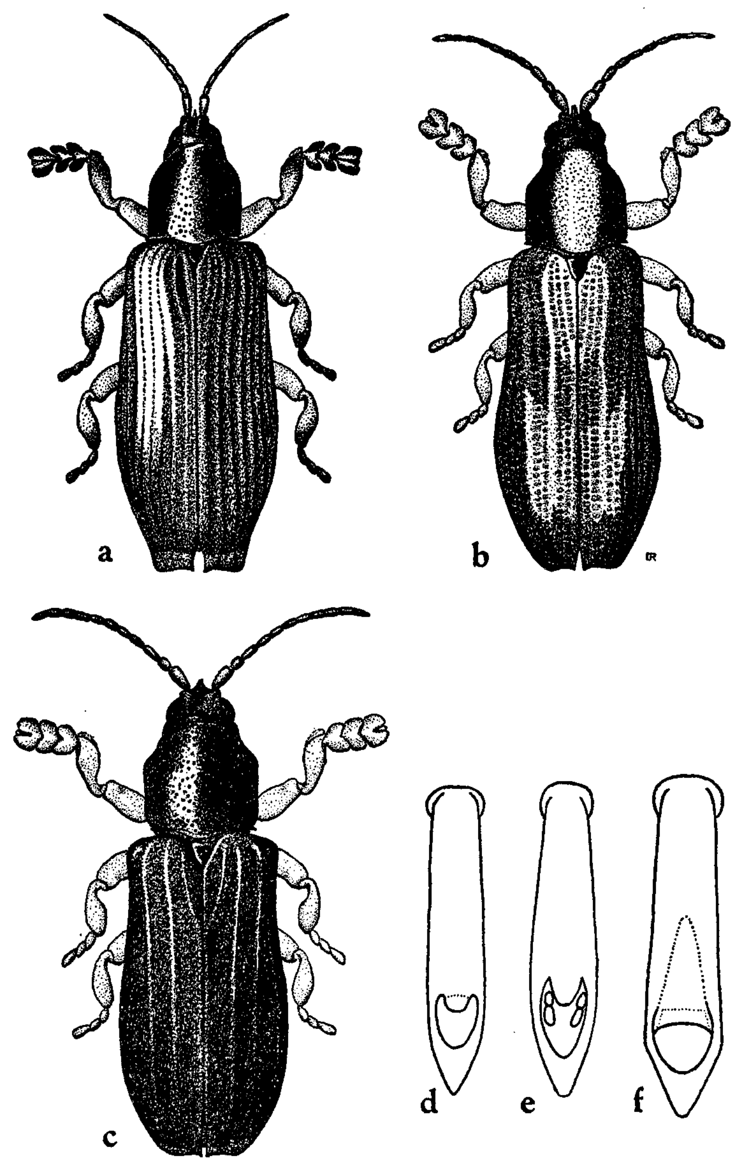


FIGURE 16.—**a**, *Oxycephala esakii,* female from Ngaremeskang; **b**, *O. spaethi,* male from Peleliu; **c**, *O. pandani,* male from southeast Babelthuap. **d-f**, dorsal view of terminal half of aedeagus of male: *d, O. esakii; e, O. spaethi; f, O. pandani.*

Female: Cephalic process slightly shorter; ectoapical angle of each elytron arcuately produced.

Mature larva: Moderately compressed dorso-ventrally; strongly convex dorsally. Pale testaceous with most of caudal process brown to blackish. Head minutely reticulate with some fine lines of brown pigmentation radiating forward from fork of epicranial suture. Prothorax broadly transverse, finely reticulate, arched slightly forward at sides and narrowed anteriorly. Spiracles slightly pigmented. Abdominal segments each several times as broad as long and each with a small posteriorly directed lateral process which tapers suddenly and is roughly about as long as broad. Last abdominal segment with several small acute processes on lower margin behind principal lateral process; tail-shovel with a large, slightly concave base, reniform spiracle, broad arm with inner branch nearly as large as actual apex and arising beyond middle of inner side, and with median spine in emargination much smaller than terminal spines; upper outer margin of arm with about nine spines of varying sizes. Length 14 mm.

DISTRIBUTION: Western Caroline Is.

PALAU. BABELTHUAP: Eleven, Ngaremeskang, alt. 30 m., Dec. 21, 1952, Gressitt; four, Aimeliik [Imeliik], Aug. 1953, Beardsley.

HOST: *Freycinetia palauensis* (Pandanaceae); rarely in *Flagellaria* or *Pleomela.*

This species is rare. It appears largely limited to the insides of the crowns of *Freycinetia,* and a minority of the crowns are found infested even at the edges of clearings. Adults were taken only in *Freycinetia.* The unique type was taken between the above two localities. Esaki tells me that it also was taken in *Freycinetia, "Pandanus"* having been used in the family sense on his label. This species is very closely related structurally to the following two, and it would appear that they descended from a single immigrant species from the south and diverged with ecological segregation. All three species were found within a few meters of each other in Ngaremeskang, each in a different ecologic niche.

35. **Oxycephala spaethi** (Chujo), new comb. (figs. 16, *b, e;* 17, *a, d, e*).

Plesispa (Plesispella) spaethi Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **24** (3): 326, fig. 19 (Angaur, Peleliu, Babelthuap; type in Taiwan Agric. Res. Inst.).

Male: Pale ochraceous from anterior margin of pronotum to top of posterior declivity of elytra, except for an incomplete irregular dark band at middle of elytra; remainder of dorsum pitchy black to brown with apices and posteriolateral margins mostly reddish brown; antenna pitchy to black; legs, and ventral surfaces, except gena, testaceous.

Head finely grooved and closely punctured on occiput, moderately convex and slightly uneven on frons. *Antenna* as in preceding species. *Prothorax* with basal tooth hardly projecting beyond lateral margin; disc fairly even, in large part closely and regularly punctured except for sparsely punctured median strip. Scutellum slightly concave, glossy. *Elytra* with punctures in part fully one-half as wide as longitudinal interspaces; interspaces distinctly raised—alternate ones more strongly so; apex slightly sinuate. *Aedeagus* with terminal half fusiform, flattish at center. Length 8.5-11 mm., breadth 2.9-3.4 mm.

Female: Cephalic process hardly shorter than in male; ectoapical angle of each elytron produced.

Mature larva: Whitish testaceous; spiracles and upper lateral spines of tail-shovel slightly darkened. Lateral processes of abdominal segments curved posteriorly and mostly longer than broad. Last abdominal segment with several flat acute processes on lower margin behind principal lateral process; tail-shovel with a strong slender branch spine arising on middle of inner margin of arm, and with median spine about the same size; upper outer margin of arm with 9-12 spines. Length 14 mm.

DISTRIBUTION: Western Caroline Is.

PALAU. BABELTHUAP: Two, Ulimang, Dec. 1947, Dybas; 12, Ngaremeskang, Dec. 1952, Gressitt; six, Ngoikul-Nggasagang (Iwang), Dec. 1952, Gressitt; five, Aimeliik [Imeliik], Aug. 1953, Beardsley. KOROR: Three, Nov. 1947, Dybas. NGARMALK (west of Ulebsehel): Two, Dec. 1952, Gressitt; three, May 1953, Beardsley. NGERGOI (Garakayo): One, Aug. 1945, Dybas. PELELIU: Eight, July 1946, Townes and Oakley; 12, northeast and east coast, Jan. 1948, Dybas; 10, Mt. Amiangal, Dec. 1952, Gressitt. ANGAUR: Two, Feb. 1948, Dybas; five, Jan. 1953, Beardsley.

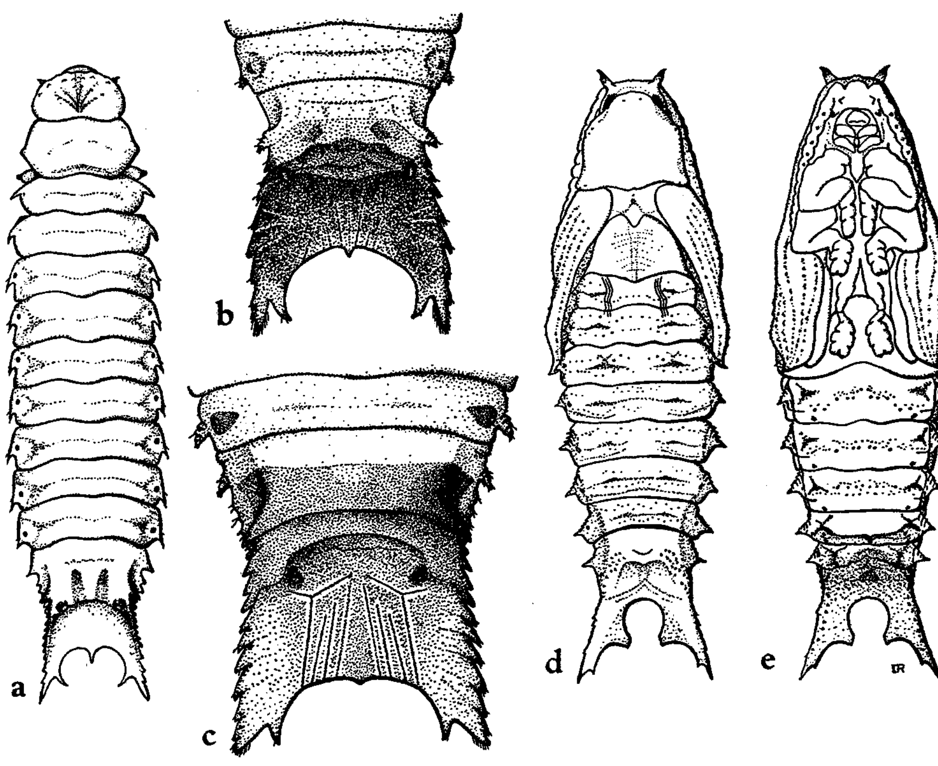


FIGURE 17.—Immature stages of *Oxycephala* spp.: **a**, *O. spaethi*, dorsal view of mature larva; **b**, *O. esakii*, dorsal view of posterior portion of mature larva; **c**, *O. pandani*, dorsal view of posterior portion of mature larva; **d**, *O. spaethi*, dorsal view of pupa; **e**, *O. spaethi*, ventral view of pupa. All from Babelthuap.

HOSTS: *Pandanus tectorius* (generally smaller varieties in jungle), *Flagellaria indica, Pleomela angustifolia, Freycinetia palauensis* (rarely).

All the above records are for *Pandanus* except for a few specimens found in *Flagellaria* and *Pleomela* and a single one in *Freycinetia,* all in Ngaremeskang. This species is normally found in crowns of *Pandanus* of smaller varieties in forest environments.

36. **Oxycephala pandani** Gressitt, n. sp. (figs. 16, *c, f;* 17, *c*).

Plesispa (*Plesispella*) *spaethi,* Chujo, 1943, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. 24 (3) : 326 (part only, from Eimilik-Ngarumisukan).

Male: Dorsum black, moderately shiny; elytra each slightly tinged with reddish brown adjacent to scutellum, on posterior portion near suture, and at apex; antennae black, partly pitchy basally; frons and clypeus largely reddish; ventral surfaces of head and thorax pitchy black; abdomen testaceous; legs ochraceous.

Head deeply and irregularly punctured on occiput, deeply grooved on anterior portion of occiput; cephalic process fairly thick, finely grooved, barely one-third as long as scape; frons strongly and subevenly convex, its surface slightly pitted and irregular. *Antenna* one-third as long as body, subcylindrical, somewhat flattened distally; scape shorter than second and third combined; third fully as long as last. *Prothorax* a little longer than broad, parallel-sided, narrowed apically; basal tooth small or lacking; disc coarsely and irregularly punctured, with some raised impunctate areas; median strip largely lacking deep punctures, and with scattered minute punctures. Scutellum slightly longer than broad, slightly uneven, moderately shiny. *Elytra* each broadened behind middle, slightly sinuate apically; punctures mostly about one-half as wide as longitudinal interspaces; interspaces slightly raised, alternate ones more distinctly so. *Ventral surfaces* shiny, in part punctured at sides of sternites. *Aedeagus* with distal half widened to subterminal opening, concave proximal to opening. Length 11.6 mm., breadth 3.7 mm.

Female: Cephalic process one-fourth as long as scape; elytral apex arcuately produced ectoapically. Length 12.4 mm., breadth 4.2 mm.

Paratypes: Length 10.2-14 mm., breadth 3.8-4.8 mm.

Mature larva: Testaceous; prothorax to last abdominal segment each with a narrow or triangular transverse blackish area on side, surrounding spiracles on first to seventh abdominal segments, and more extensive on pronotum; caudal process pitchy brown on basal portion, much paler beyond spiracles. Lateral processes of abdominal segments directed posteriorly, longer than broad, mostly nearly as long as distance from spiracle. Last abdominal segment with several very short blunt processes on lower margin behind principal lateral process; tail-shovel very broad, with emargination shallow, median spine obtuse and inner branch spine stout, but much smaller than apex of arm, and arising beyond middle of inner margin; upper outer margin with 10-12 spines. Length 16 mm.

Holotype, male (US 62415), Ngaremeskang, at alt. 30 m., west-central Babelthuap I., Palau, in large *Pandanus,* Dec. 21, 1952, Gressitt; allotype, female (US), near Iwang, between Ngoikul and Nggasagang, Irrai District, southeast Babelthuap, Dec. 17, 1952, Gressitt; paratypes (BISHOP, KU, BM, CAS, CM, TT): Two, Iwang, three Ngaremeskang, Gressitt; one, south Babelthuap, July 22, 1946, R. G. Oakley; one, Ulimang, northeast Babelthuap, in ornamental *Pandanus,* Dec. 10, 1947, Dybas; three, Eimilik-Ngarumisukan [Imeliik to Ngaremeskang], Aug. 18, 1939, T. Esaki (one a

cotype of *spaethi* Chujo). Koror I.: Two, Aug. 19, 1953, J. W. Beardsley. Ngerkabesang (Arakabesan) I.: One, Feb. 1954, Beardsley.

DISTRIBUTION: Northern Palau.

HOSTS: *Pandanus tectorius* var. (*P. kanehirai* ?); also ornamental *Pandanus*.

Differs from *Oxycephala spaethi* (Chujo) in being larger, in being entirely black, or at most with limited reddish-brown areas on elytra adjacent to scutellum, suture, and apex, in having the pronotum coarsely and unevenly punctured, with raised impunctate areas, in having the tooth at basal angle of prothorax more or less obsolete and the frons rather evenly convex instead of depressed on portion near antennal insertions. Differs from *O. esakii* (Chujo) in most of the above characters, and in lacking metallic green elytra and lacking ridges on the frons.

This species occurs in large *Pandanus* plants, generally in exposed situations. The type locality is shown in figure 24 of the introduction to this series (vol. 1). *O. spaethi* and *esakii* were taken in the jungle to the left of the clearing with scattered *Pandanus,* where this species was found. The *Pandanus* varieties in Palau have been divided by some botanists into many species, and by others they are mostly united as *P. tectorius.* The latter assemblage, however, includes plants of quite different size and form in different ecologic environments. The above specimens taken by Esaki and Beardsley (southwest Babelthuap, Koror, and Ngerkabesang) may represent an incipient fourth species. They exhibit greater range of size and have a little brown color near scutellum, suture, and apex on each elytron.

Key to Larvae of Micronesian Hispinae

1. Lateral processes of abdominal segments about one-third as long as transverse width of an abdominal segment; caudal process (tail-shovel) with arms fairly narrow and unbranched, and emargination fully as deep as wide (*Brontispa*) 2

   Lateral processes of abdominal segments about one-tenth as long as transverse width of an abdominal segment; caudal process (tail-shovel) with arms broad and forked, hairy on extreme apex, and emargination much wider than deep (*Oxycephala*) 4

2(1). Mesothorax and metathorax without lateral processes like those of abdomen; caudal process with emargination about as deep as wide and arms bent suddenly inward near apices 3

   Mesothorax and metathorax with lateral processes like those of abdomen; caudal process with emargination much deeper than wide and arms gradually tapering and without angles on outer sides near tips .... **B. chalybeipennis**

3(2). Caudal process with arms straight and obliquely diverging on external margins, widest at ectoapical angles; emargination about one-half as deep as length of segment .... **B. mariana**

   Caudal process with arms somewhat arched on external margins, widest before ectoapical angles; emargination less than one-half as deep as length of segment .... **B. palauensis**

4(1). Processes behind principal lateral process on lower external margin of last abdominal segment distinctly tapering and acute; upper outer margin of tail-shovel with about four spines in distal half; emargination of tail-shovel generally about one-half as deep as wide; abdominal terga without a black area on each side around spiracle........ 5

Processes behind principal lateral process on lower external margin of last abdominal segment short and blunt; upper outer margin of tail-shovel with at least five spines in distal half; emargination of tail-shovel distinctly less than one-half as deep as wide; abdominal terga with a transverse black area on each side around spiracle........**O. pandani**

5(4). Median spine of emargination of tail-shovel nearly as long as inner branch of each arm; inner branch forking near middle of inner margin of arm; lateral processes of abdominal segments each about as long as distance from base to spiracle; body almost entirely pale, with only slight pigmentation on base of tail-shovel........**O. spaethi**

Median spine of emargination of tail-shovel much shorter than inner branch of each arm; inner branch forking well distal to middle of inner margin of arm; lateral processes of abdominal segments each shorter than distance from base to spiracle; tail-shovel almost entirely dark brown to blackish except for extreme tips of arms........**O. esakii**

Subfamily CASSIDINAE

Prothorax and elytra generally with broadly expanded margins; pronotum often hiding head in dorsal view. Larvae generally live exposed on leaves, with exuviae, and also often feces, held above body by a paired caudal structure; often feed on plants of the Convolvulaceae.

The Micronesian species are recent introductions.

Tribe CASSIDINI

Genus **Cassida** Linnaeus

Cassida Linnaeus, 1758, Syst. Nat., ed. 10, **1**: 362 (type: *C. nebulosa* Linnaeus; Europe).

Taiwania Spaeth, 1913, Mus. Nat. Hungarici, Ann. **11** (1): 47 (type: *T. sauteri* Spaeth; Formosa).—Gressitt, 1952, Calif. Acad. Sci., Proc. IV, **27** (17): 486.

Subgenus **Taiwania** Spaeth

Key to Micronesian Species of Cassida

1. Pronotum impunctate; body about 5 mm. long; testaceous (golden green in life), elytra marked with a black discal stripe on each, forming a more or less common horse-shoe shaped mark, and a little black behind scutellum; rarely without black markings........**circumdata**

Pronotum finely punctured; body about 4 mm. long; dorsum entirely pale testaceous (golden in life)........**obtusata**

37. Cassida (Taiwania) circumdata Herbst (fig. 18).

Cassida circumdata Herbst, 1790, Natursyst. Kaf. **8**: 268, pl. 132, fig. 11 [East Indies; type in Berlin (?)].

Cassida trivittata Fabricius, 1801, Syst. Eleuth. **1**: 397 (East Indies; type in Kopenhagen).

Metriona circumdata, Weise, 1901, Deutsche Ent. Zeitschr. **1901**: 53.—Yeung, 1934, Lingnan Sci. Jour. **13**: 143-162, 2 pls.

Cassida (Taiwania) circumdata, Gressitt, 1952, Calif. Acad. Sci., Proc. IV, **27** (17): 489, pls. 28, 36.

Dorsum pale testaceous (brilliant golden green in life), marked with a black stripe on each elytron roughly forming a common horse-shoe shaped mark, with some small black spots behind scutellum; ventral surfaces entirely pale.

Body nearly circular in outline. *Head* hidden from above by pronotum, smooth on frons. *Antenna* extending beyond humerus, gradually thickened distally, darkened on last segment. *Pronotum* smooth, shiny, transversely elliptical; disc impunctate; lobe meeting scutellum slightly convex. *Elytra* subevenly convex on discs, deeply punctured; explanate margin broad, moderately declivitous, impunctate, though sometimes apparently punctured. *Ventral surfaces* smooth or frosted. Length 4.8-5.2 mm., breadth 4.1-4.5 mm.

Mature larva: Pale green. Body flat and ovate with large lateral processes bearing many small spinules; four on each side of prothorax, two on each side of both mesothorax and metathorax, and one on each side of each abdominal segment; fifteenth process more than twice as long as fourteenth, one-half again as long as sixteenth; fifteenth and sixteenth of previous instars prominently projecting and separate from the preceding shorter spines in exuviae. Exuviae of each of the four preceding larval instars retained on caudal

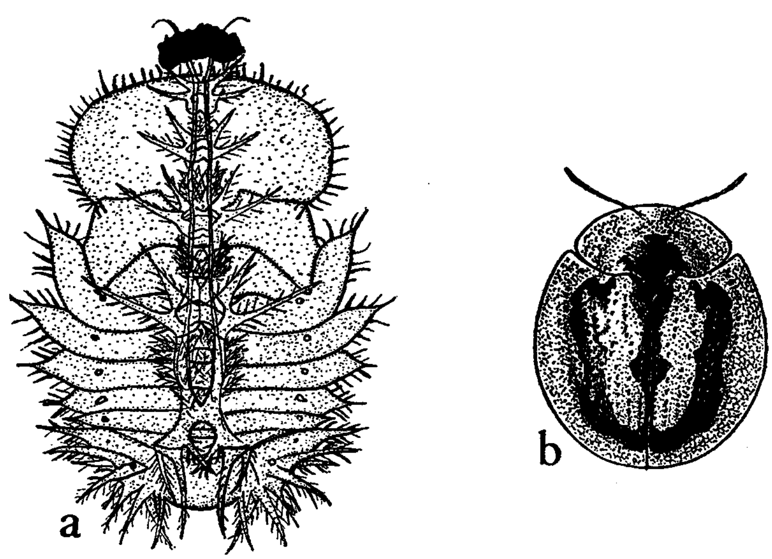


FIGURE 18.—*Cassida (Taiwania) circumdata:* **a**, dorsal view of pupa, with "parasol" of successive larval exuviae tipped with feces folded over body in more common position (after Yeung, 1934, Lingnan Sci. Jour. **13**: pl. 12); **b**, adult (after Gressitt, 1952, Calif. Acad. Sci., Proc. IV, **27** (17): pl. 28, fig. 2).

process, and a small transverse mass of feces mounted on terminal spines (branches of caudal process of first instar). Length 4.5 mm. (excluding caudal "parasol" which may be extended or folded over body).

DISTRIBUTION: Southeast Asia to South China, Ryukyu Is., Kyushu, and western Micronesia.

S. MARIANA IS. TINIAN: One, Nov. 1952, Beardsley. GUAM: One, June 1945, J. R. Stuntz; four, Sept. 1951, R. M. Bohart; many, Nimitz Beach, Mt. Lamlam, Mt. Alifan, Potts Junction, and Agana, Aug. 1952, Krauss; Agana, Oct. 1952, Beardsley; Mt. Lamlam, Tutujan, Pt. Oca-Tumon, Barrigada, Nov. 1952, Gressitt.

PALAU. BABELTHUAP: Three, Iwang, Dec. 1952, Gressitt. KOROR: Two, July 1952, Beardsley; one, Sept. 1952, Krauss. ANGAUR: Two, Jan. 1953, Beardsley.

TRUK. WENA (Moen): Three, Oct. 1952, Beardsley.

HOSTS: *Ipomoea* spp.

This widely distributed sweet-potato pest must have been introduced to Guam during 1945 from Luzon, and from Guam to the other Micronesian islands listed. Philippine specimens have less of a median black stripe than do those from farther north.

38. Cassida (Taiwania) obtusata Boheman (fig. 19).

Cassida obtusata Boheman, 1864, Mon. Cassid. **2**: 405 (India; type in Stockholm Mus.).

Cassida sp., Maehler, 1950, Hawaiian Ent. Soc., Proc. **14** (1): 9 (Guam).

Cassida (Taiwania) obtusata, Gressitt, 1952, Calif. Acad. Sci., Proc. IV, **27** (17): 497, pl. 34.

Pale testaceous (bright golden in life), except for black eyes and partly pitchy abdomen.

Body broadly ovate in outline. *Head* hidden by pronotum; frons slightly punctured. *Antenna* barely reaching beyond humeral angle, distinctly thickened in distal half. *Prothorax* transversely elliptical, more than twice as broad as long; disc sparsely punctured; lobe meeting scutellum truncate or slightly emarginate. *Elytra* widest just behind humeral angles, narrowed posteriorly; disc of each with deep punctures which are mostly narrower than interspaces; explanate margins moderately declivitous, with a few punctures. *Ventral surfaces* somewhat wrinkled. Length 3.7-4.2 mm., breadth 3-3.2 mm.

Mature larva: Pale green. Lateral processes not varying much in length; fifteenth and sixteenth processes subequal and only slightly longer than fourteenth, not separate and not projecting in exuviae of previous instars. Feces attached to exuviae in a rough mass, largely obscuring them.

DISTRIBUTION: India, Burma, Indo-China, South China, Taiwan, Luzon, and Guam.

S. MARIANA IS. GUAM: A few taken by Fullaway in 1911; 27, Haputo Pt. and Tweeds Cave, Mar. 1948, Maehler; one, Mar. 1948, Dybas; one Agana, Oct. 1952, Krauss.

HOSTS: *Amaranthus retroflexus, A. spinosus, Celosia argentea, Cestrum nocturnum* (larvae and adults), and *Citrus* spp. (adults only).

This species, though apparently on Guam for a long time, is restricted in occurrence. It was not taken by Swezey and Usinger or by G. Bohart and Gressitt. It has not yet been noted feeding on *Celosia* on Guam.

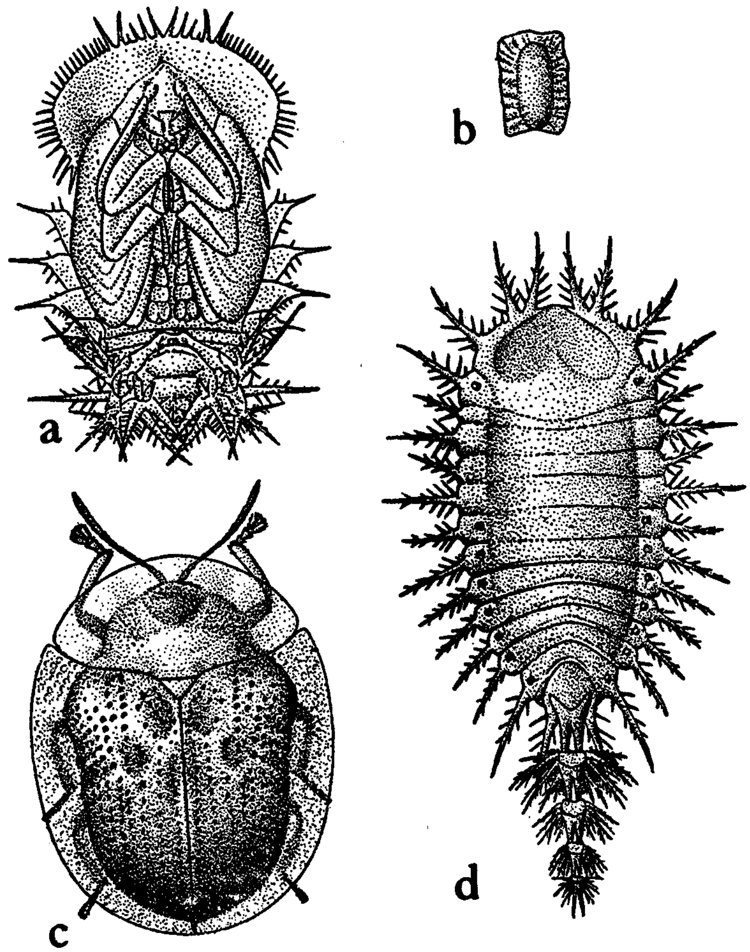


FIGURE 19.—*Cassida (Taiwania) obtusata:* **a**, ventral view of pupa; **b**, dorsal view of egg in egg-capsule; **c**, adult; **d**, dorsal view of mature (fifth instar) larva, with "parasol" of earlier larval exuviae folded backward in less common position. [After Gressitt, 1952, Calif. Acad. Sci., Proc. IV, 27 (17): pl. 34.]